Customer Engineering Service

olivetti EDITOR 4-4C technical manual

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PREFACE

The Olivetti Editor 4 and 4C Technical Manual covers, in Sections 1 through 29, the basic operational functions, part movements, and adjustments of the Editor 4 and 4C electric typewriters.

The Editor 4 and 4C are identical typewriters with the exception that the Editor 4 is designed to use a fabric ribbon exclusively whereas the Editor 4C uses a carbon ribbon exclusively. The carbon ribbon mechanism of the Editor 4C is covered separately in Section 30.

Both the Editor 4 and 4C electric typewriters are obtainable with a Decimal Tabulation feature which is covered in Section 31.

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SECTION 1

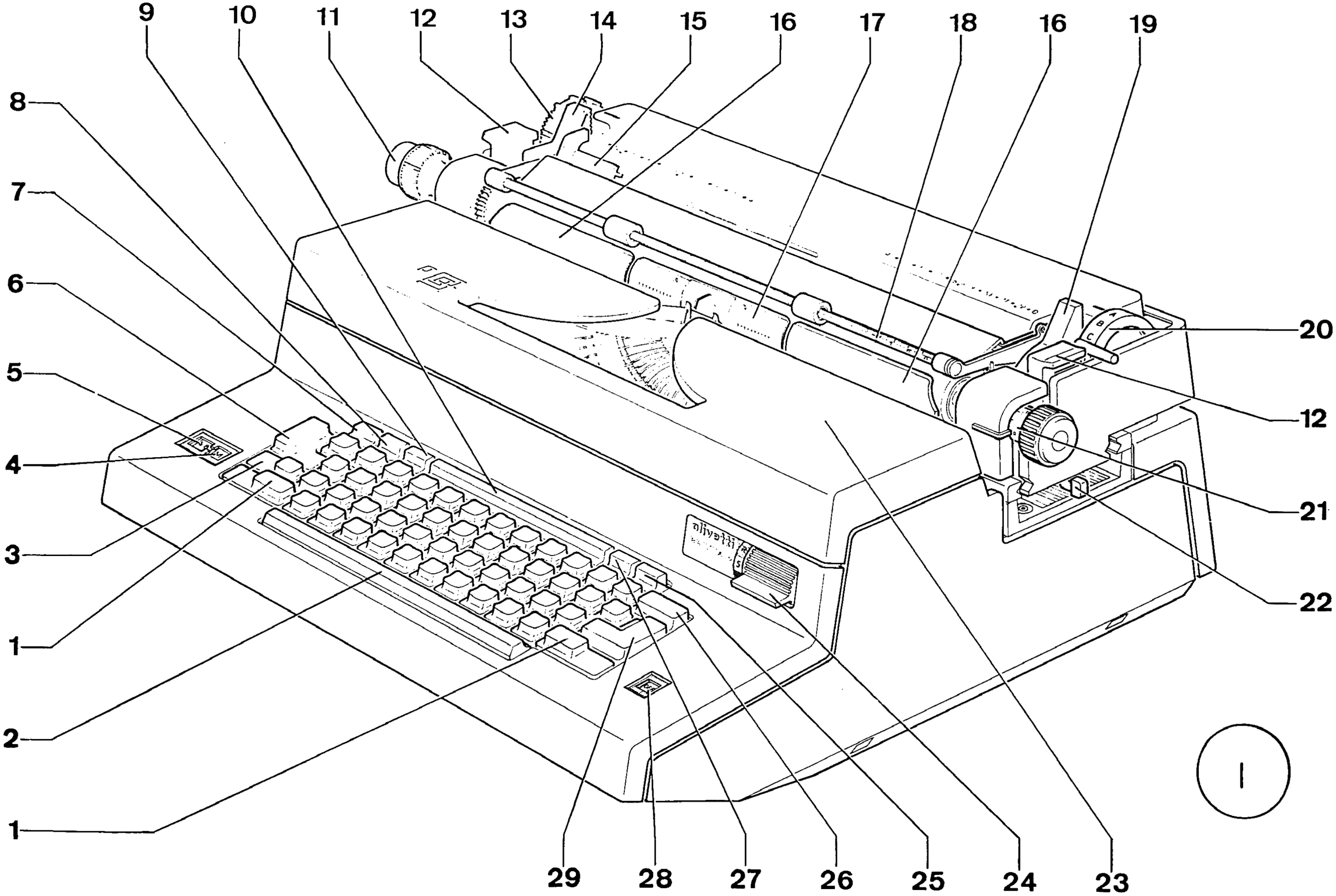
SPECIFICATIONS AND FEATURES

TECHNICAL SPECIFICATIONS

Machine Measurements	Carriage Length, In.	Millimeters	Inches
Depth	13,18,21,27	432	17
Height	13,18,21,27	230	9
Width	13	507	19.9
	18	623	24.5
	21	700	27.5
	27	871	34.3
Length of Platen	13	341	13.4
	18	462	18.1
	21	538	21.1
	27	710	27.9
Length of Writing Line	13	322	12.6
	18	444	17.5
	21	520	20.5
	27	691	27.2
Shift Motion		8	.315
		6.6	.260
Character Key Lever Travel:			
Non-Repeat		3	.118
Repeat		6.5	.255
		Kg.	Lbs.
Weight of Machine	13	21	46.2
	18	22	48.4
	21	23	50.6
	27	25	55.0
Pitch	8, 10, 12, 16		
Motor	115 volts, 60 cycles, 50 watts		

MACHINE FEATURE IDENTIFICATION

1. Shift Keys
2. Space Bar
3. Shift Lock Key
4. Touch Control Dial
5. Copies Control Dial
6. Half Space Key
7. Margin By-Pass Key
8. Margin Set Key
9. Express Margin Key
10. Tabulator Bar
11. Variable Line Spacer Button
12. Carriage Release Buttons
13. Line Space Dial
14. Memory Line Finder
15. Lateral Paper Guide
16. Transparent Paper Deflectors
17. Transparent Card Holder and Aligning Scale
18. Paper Bail
19. Paper Release Lever
20. Platen Position Dial
21. Page-End Indicator
22. Carriage Lock Lever
23. Hinged Top Cover
24. Ribbon Selector Lever
25. Tab Set Key
26. Back Space Key
27. Tab Clear Key
28. Motor Switch Dial
29. Carriage Return Key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FEATURES OF THE EDITOR 4

INTRODUCTION

The Editor 4 is a modern electric typewriter incorporating many outstanding features, making it possible to produce quality typewritten work with ease and efficiency. Error-free typing on the Editor 4 is a result of a special built-in "memory feature." Every keyboard-controlled operation of the machine is electrically powered.

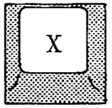
The Editor 4 is designed to use a fabric ribbon only. The Editor 4C (carbon-ribbon machine) is basically the same as the Editor 4, but is designed to use a carbon ribbon only.

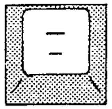
KEYBOARD

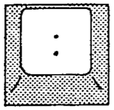
The machine is designed for a maximum of 45 character keys, making a total of 90 printing characters. The keyboard is locked when the motor switch dial (28) is in the OFF position.

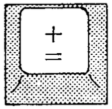
REPEAT KEYS

The standard keyboard of the Editor 4 is equipped with the following four repeat character keys:









In addition, the space bar (2), the carriage return key (29), the back space key (26), and the tabulator bar (10) will cause their respective actions to repeat when held fully depressed.

TYPING SPEED AND KEY LEVER SELECTION

The Editor 4 can print at a maximum speed of 920 characters per minute, which exceeds the typing speed of accomplished typists.

A memory feature will enable printing to occur even though two character keys have been depressed in very rapid sequence, or at an approximate speed of 1850 key strokes per minute. In this case, the machine will automatically retain the second key stroke in memory until the printing cycle of the first key stroke has been completed. The second character will then be released from memory and print in proper sequence at the maximum printing speed.

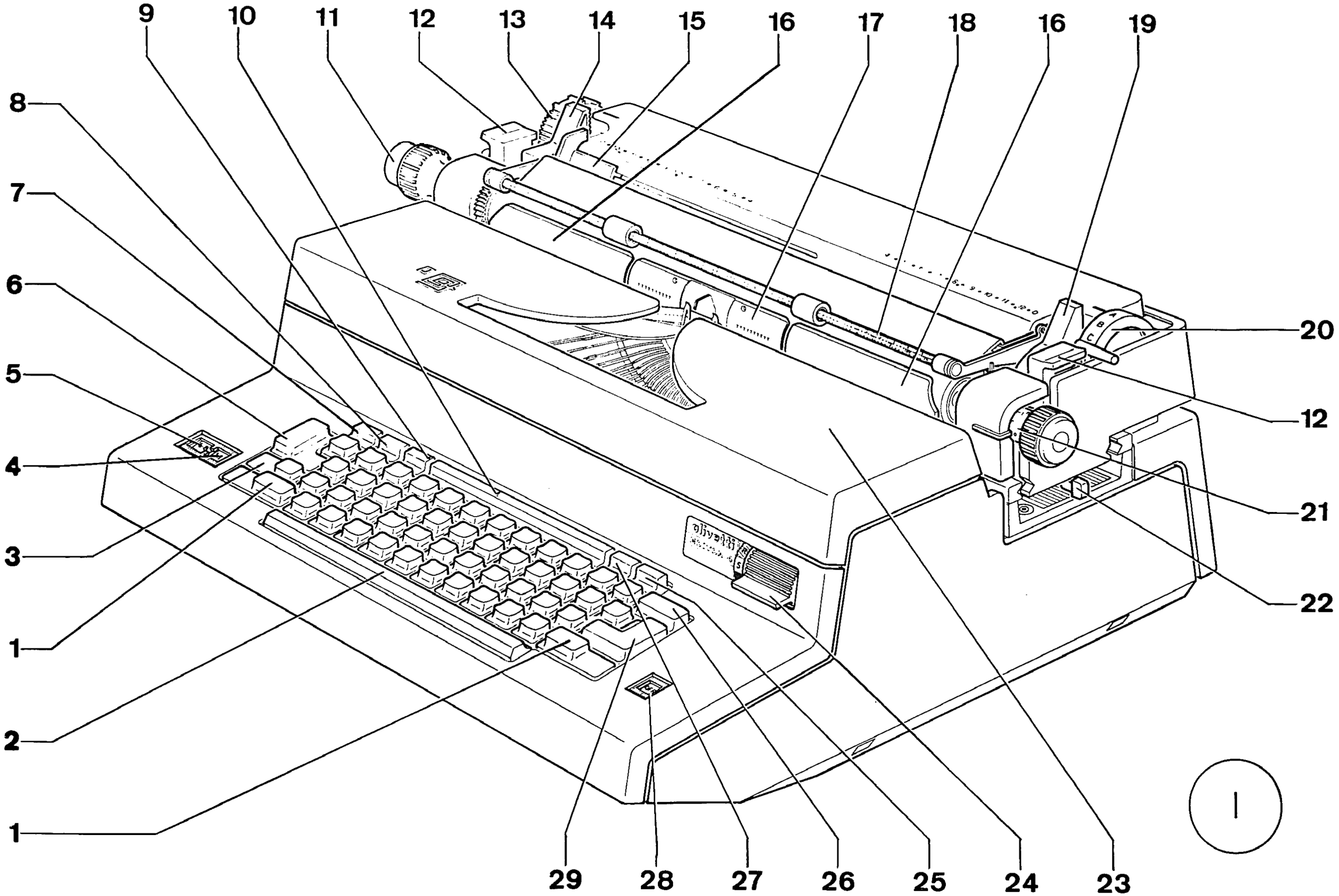
KEYBOARD DEACTIVATION

If two character key levers are depressed simultaneously, the carriage will advance by one space, but the printing mechanism and keyboard will deactivate. This feature reduces typing errors and eliminates type bar collision and jamming in the type guide.

The reactivation of the keyboard and printing mechanism is obtained by depressing the back space key (26), which will also position the carriage in correct relationship to the last character printed.

REVERSE UNDERSCORING

The Editor 4 offers a feature which permits printing to occur, in rhythmic sequence, while the carriage is backspacing. This feature facilitates the underscoring of a word, title or column of figures. To accomplish the above, fully depress both the underscore key and the back space key simultaneously. The machine will automatically print the underscore and then backspace the carriage. Both keys must be held depressed until the underscoring is completed.



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A
B
C

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SHIFT KEYS

The shift keys (1) enable the operator to select either the upper or lower case characters. The shift lock (3) is used when typing a series of upper case characters. A memory feature between the shift movement and the typing action eliminates the possibility of printing a character while the segment is in motion.

MEMORY BETWEEN TYPE ACTION AND SPACE BAR

The Editor 4 has a unique feature in the form of a memory between the actions of typing and spacing. This feature prevents the possibility of losing the space between words if the space bar happens to be depressed during a printing cycle.

COPIES CONTROL DIAL

The copies control dial (5), provides the operator with a choice of four different ranges of type bar impression, depending on the number of copies being made.

To ensure the maximum uniformity of impression between characters, each type bar mechanism is controlled so that the force of impact of the type bar is directly proportional to the printing surface of the specific character. The Editor 4 automatically compensates for the increased surface area of the characters when typing capital letters.

TOUCH CONTROL DIAL

The touch control dial (4) provides the operator with the choice of the following five degrees of keyboard touch: light, medium light, medium, medium firm, and firm.

HALF SPACE KEY

The half-space feature facilitates the replacement of one word with another which contains either one more or one less character.

When the half space key (6) is depressed on the Editor 4, the carriage will backspace one half space. If the half space key is held depressed, an entire word can be typed, at moderate speed, and be offset by one half space.

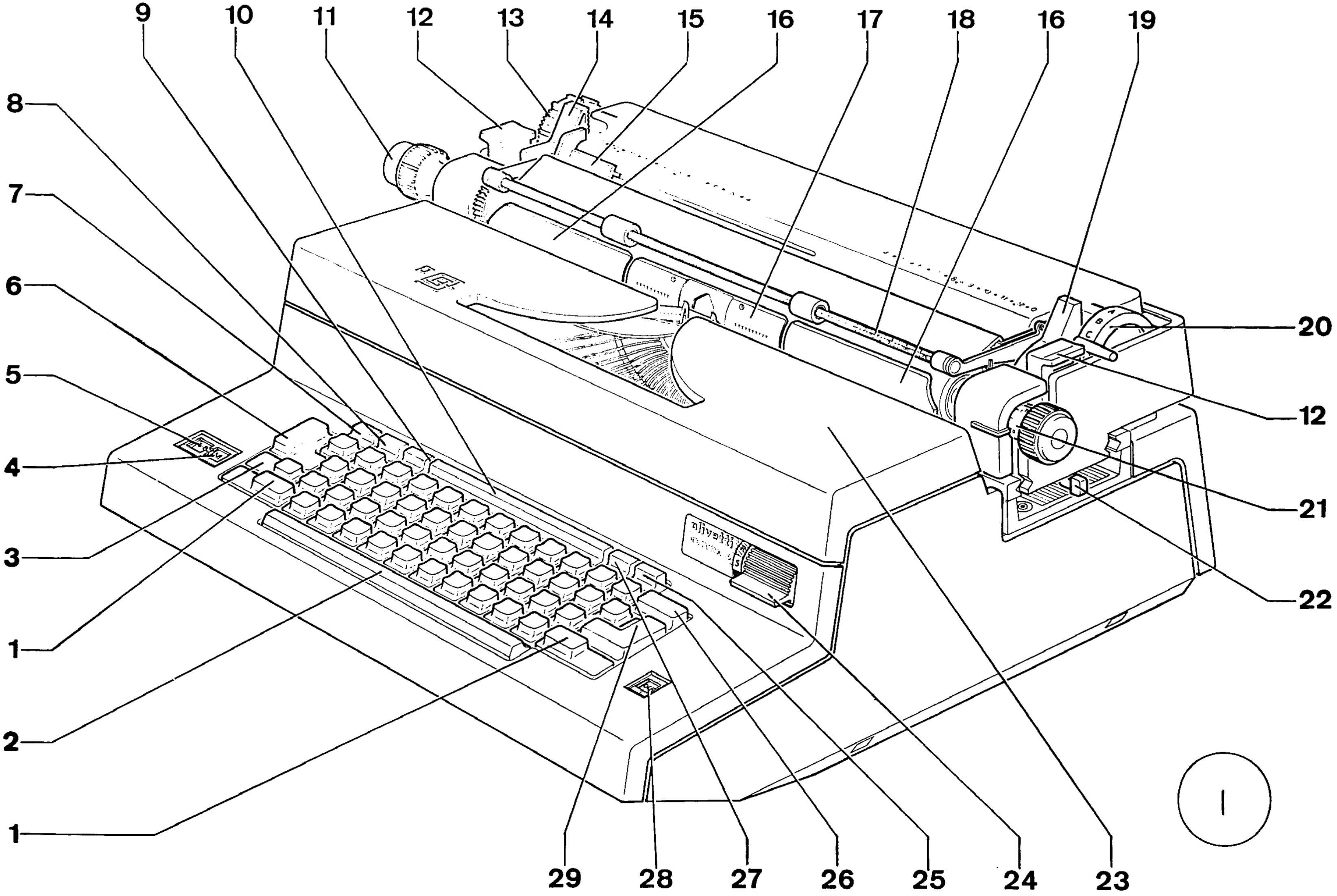
MARGIN BY-PASS KEY

The margin by-pass key (7) is used when the operator wishes to type beyond the established position of either the left or right margin stops.

MARGIN SET KEY

Both the left and right margin stops can be automatically positioned from the keyboard. To position either margin stop:

- Position the carriage at the existing margin stop which is to be relocated.
- Depress and hold depressed the margin set key (8).
- Move the carriage to the position desired for the new margin stop setting.
- Release the margin set key.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EXPRESS MARGIN KEY

If an entire paragraph is to be indented, in respect to the regular margin stop setting, the left margin stop can be quickly positioned to the desired location by using the express margin key (9).

The express margin may be used as follows:

- Set a tab stop at the normal left margin stop position.
- Set a second tab stop at the desired indented paragraph position.
- Return the carriage to the left margin stop. Lightly depress the express margin key (9), which will automatically engage the margin stop and tabulate the carriage to the second tab stop. The margin stop will now be located at the position of the second tab stop.
- To reposition the margin stop to the first tab stop, fully depress the express margin key. This will cause the carriage to return and override tabulation. When the carriage returns beyond the first tab stop position, release the express margin key. The carriage will then tabulate to the first tab stop, and the left margin stop will be located at that position.

If it is desired to locate the left margin stop to the start of the writing line:

- Return carriage to the existing left margin stop.
- Fully depress the express margin key to return the carriage to zero position.
- Lightly depress and quickly release either the back space key (26) or the tabulator bar (10).
- Release the express margin key. The left margin stop will now be located at zero position.

  Note. Only the left margin stop can be relocated with the use of the express margin key.

  When the carriage is returned by use of the express margin key, line spacing is excluded.

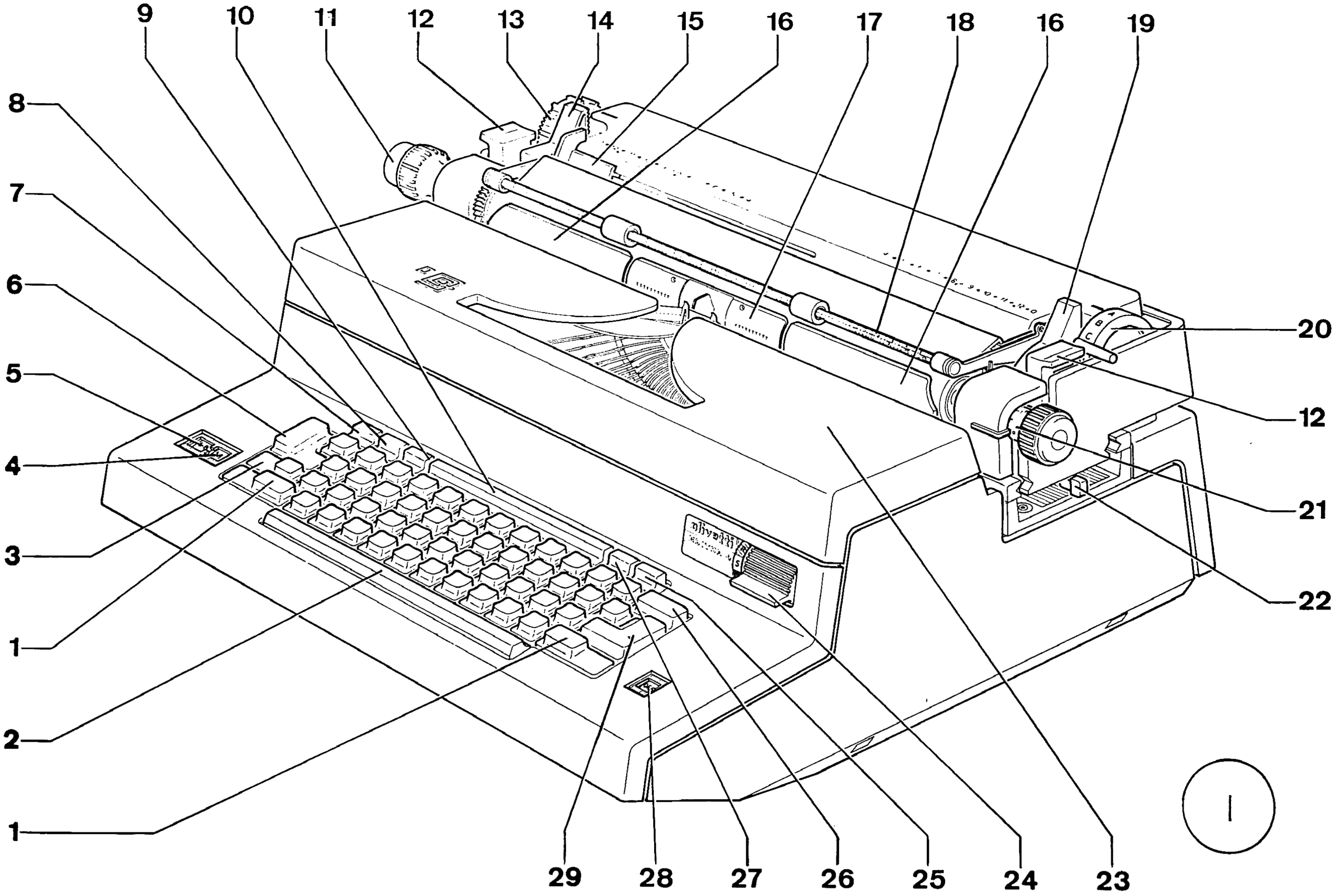
TABULATION

The tabulator provides the capability of fast and accurate columnar listing of names, numbers, etc.

- Tabulator stops are preset in desired positions by depression of the tab set key (25).
- The tabulation of the carriage to the preset stop is obtained by depressing the tabulator bar (10).
- Skip tabulation is obtained by depressing the tabulator bar fully, by-passing a series of set stops.
- Tabulation can be interrupted by depressing the tabulator bar a second time.
- Reverse tabulation is achieved by depressing the tabulator bar during a carriage return operation.
- Tabulator stops can be individually cleared by depressing tab clear key (27) while the carriage is at the desired position.
- All tabulator stops can be cleared by holding the tab clear key depressed during either a carriage return or tabulation operation.

VARIABLE LINE SPACE BUTTON

The variable line space button (11) allows the operator to disengage the platen from the line space ratchet to start typing on a new line space pattern.



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LINE SPACE DIAL

The line space dial (13) provides the operator with a choice of five different widths of vertical line spacing.

MEMORY LINE FINDER

The memory line finder (14) enables the operator to obtain a temporary release of the platen from the established line space pattern and allows a return to the original line spacing.

PLATEN POSITION DIAL

The platen position dial (20) enables the operator to position the platen back or forth to compensate for the number of copies being made and the thickness of paper. The platen position dial has five positions, marked from A to E. Position A is the norm and is used when preparing 1 to 4 copies; B through E are used for progressively increasing numbers of copies.

PAGE-END INDICATOR

The page-end indicator (21) is located on the right platen knob. This device conveniently enables the operator to determine the amount of paper remaining to the bottom of the page.

HINGED TOP COVER

The hinged top cover (23) can easily be rotated forward when the motor switch dial is in the OFF position. This facilitates ribbon replacement, type cleaning, etc.

BACK SPACE KEY

When the back space key (26) is depressed, the carriage will move back one space. If the key is held fully depressed, the backspace action will repeat.

The back space key also reactivates the keyboard after deactivation.

MOTOR SWITCH DIAL

To start the machine, the motor switch dial (28) must be rotated. The switch is accessible from the underside of the keyboard. The word ON will appear through the opening in the keyboard housing.

CARRIAGE RETURN KEY

When the carriage return key (29) is depressed:

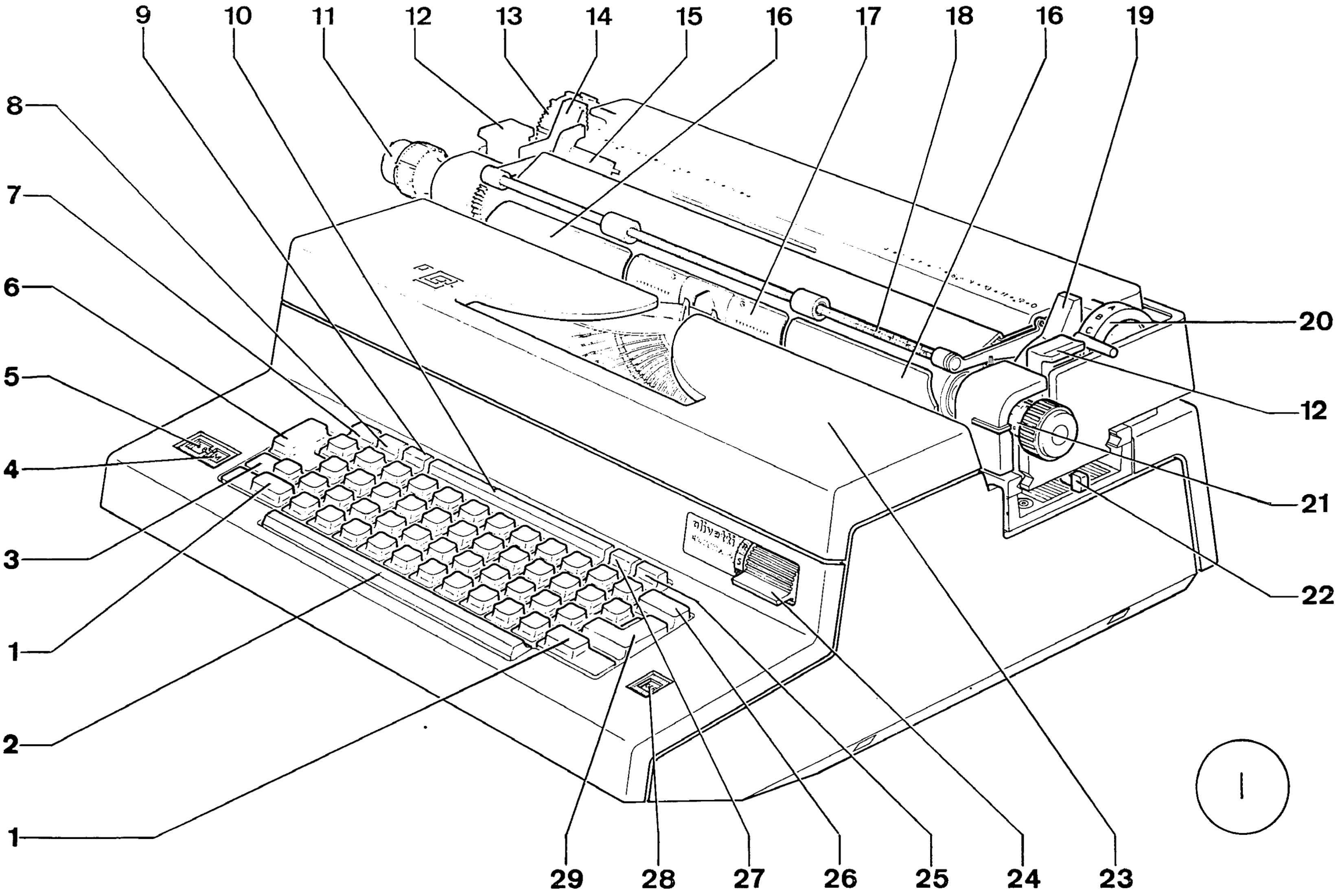
- Line spacing occurs.

- The carriage returns to the left margin stop. If the carriage return key is held fully depressed at the left margin, the line spacing will repeat.

CARRIAGE LOCK LEVER

The carriage lock lever (22) is located on the lower right end of the carriage. When the red knob of the lock is pulled forward, the carriage is locked and prevents possible damage to the escapement mechanism while the machine is in transit.

Under normal conditions the carriage lock must be fully to the rear to allow free movement of the carriage.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SECTION **2**

MOTOR - CAMS - POWER SHAFT

POWER TRANSMISSION

The power transmission is obtained through an assembly of electrical and mechanical components which transforms the electrical power into a constant rotation of the power shaft.

ELECTRICAL COMPONENTS

- Receptacle (10) with internal ground connection
- Motor (8) supported by rubber mounts (7) at each end
- Motor switch (15)
- Motor switch contact points (A) and (A1)
- Capacitor (9)

MECHANICAL COMPONENTS

- Motor pulley (6) transmits the drive from the motor to the power shaft pulley (1), through the belt (5), intermediate pulley (3) and belt (2).
- The power shaft (16) rotates in self-aligning bushings (12) located in both external sidewalls. Each bushing is held in position by a spring (13). (Refer to figure 2.)

ELECTRICAL ACTIVATION

Electrical power is supplied by closing the contact points (A and A1) through rotation of the motor switch (15).

MECHANICAL ACTIVATION

The power shaft rotates at an approximate speed of 307 rpm through the belts and pulleys illustrated in figure 1.

Assembled on the power shaft are four cam groups (not illustrated) which actuate the various mechanisms in the machine.

A safety device (not shown) is coupled with a link (11), preventing the machine top cover from being opened when the motor switch dial (15) is in the ON position.

ADJUSTMENTS

Belt Tension Adjustment.

The two belts (2 and 5) must have sufficient tension to prevent slippage. Excessive tension can cause noise.

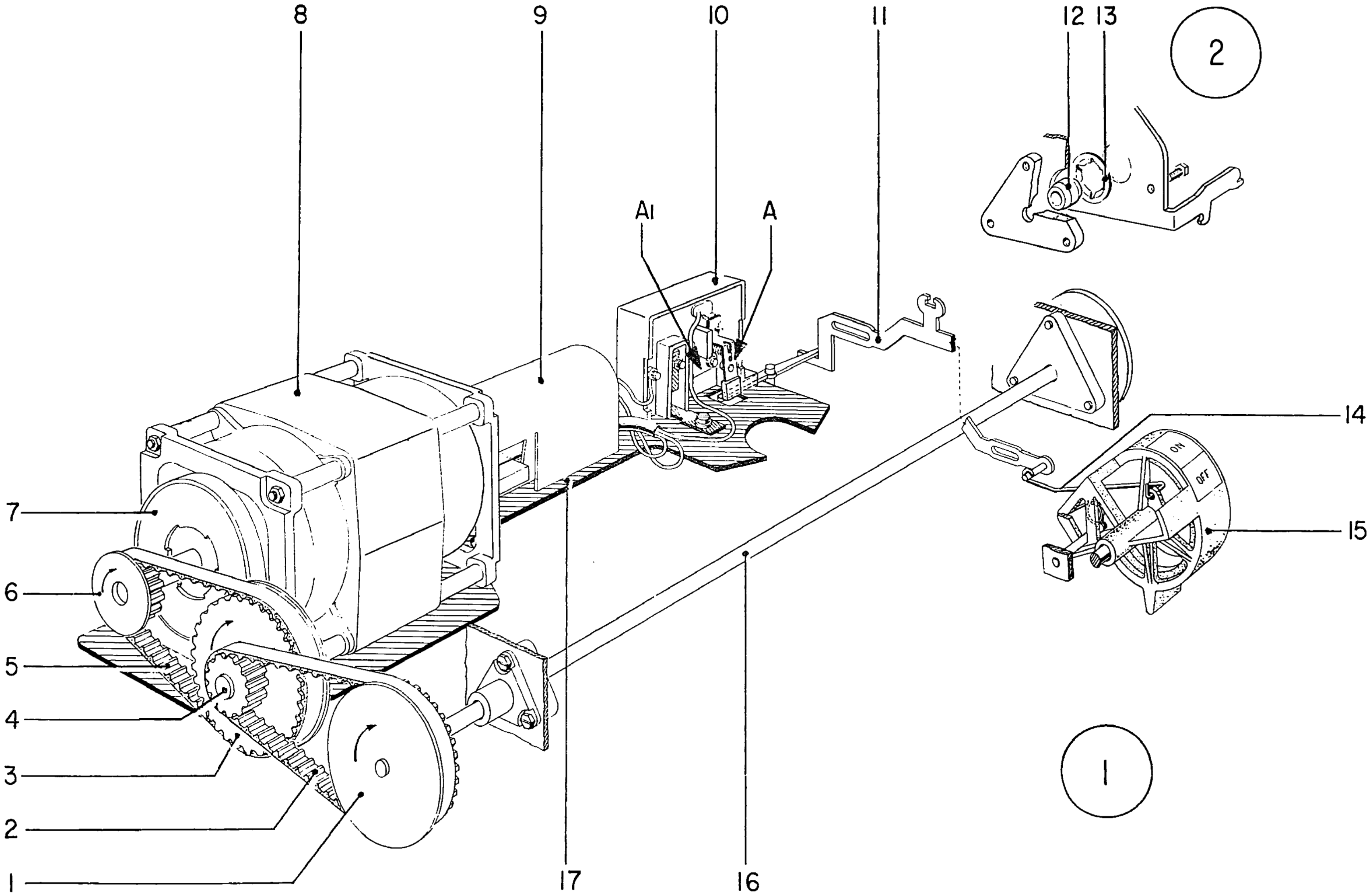
To adjust:

- Loosen the intermediate pulley shaft (4) and position the intermediate pulley (3) back or forth for proper tension of the front belt.
- Loosen the three screws in the motor mounting plate (17) and position it back or forth for proper tension of the rear belt. The rear belt can be adjusted with slightly more slack than the front belt.

Motor Switch Contact Points Adjustment.

With the motor switch dial (15) in the OFF position, the contact points (A and A_1) must open between 0.5 to 1.0 mm. When in the ON position, the contact points must be firmly closed.

To adjust, reposition the receptacle (10) as required.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A1
A
ON
OFF
①

CAM GROUPS AND THEIR FUNCTIONS

Figures 3 through 6 show the four cam groups which control the various functions of the machine. The cam groups are assembled free on the power shaft (1) and only rotate with the power shaft when they are activated by their respective starting levers (9).

Each cam group is provided with a clutch assembly which allows the cam group to be engaged with the power shaft.

> Note: The assembly, activation, and restoration of the print cam group are given below. Following this, the functions and differences of the spacing, shift and service cam groups are given.

ASSEMBLY (REST POSITION) OF PRINT CAM GROUP

Figure 3 shows the print cam group which has the basic functions of:

- Printing
- Ribbon lift and feed
- Escapement trip

The print cam group consists of the following:

- Print cam profile (7)
- Ribbon lift profile (6)
- Escapement trip and ribbon feed profile (4)
- Clutch assembly which is comprised of:
  - Ratchet pawl (5) pivoting on stud of profile (4)
  - Flange (3) which controls the ratchet pawl
  - Ratchet (8) which is fastened to the power shaft (1)

At rest position the print cam group has pressure applied to it (in the direction indicated by the arrow) by a cam follower (not shown in figure). The flange (3) is held by the starting lever (9) which causes the pin (B) of the ratchet pawl (5) to locate in the lower portion of the cam slot (A). The ratchet pawl (5), therefore, is held disengaged from the ratchet (8) and the clutch is open.

ACTIVATION OF PRINT CAM GROUP

For the cam group to rotate with the power shaft, the pawl (5) must engage the ratchet (8).

When a character key lever is depressed, the starting lever (9) releases its hold on the spur of the flange (3). The spring (2) causes the flange to rotate slightly, making the pin (B) ride up in the cam slot (A). This action causes the pawl (5) to engage the ratchet (8). The cam group now rotates with the power shaft to perform its required functions.

RESTORATION OF PRINT CAM GROUP

When the starting lever (9) is returned to its rest position, its wing will be in the path of a spur of the flange (3) and, therefore, in position to stop rotation of the flange. After the flange stops, the cam will continue to rotate slightly, causing the pin (B) to ride down in the cam slot (A). This action disengages the pawl (5) from the ratchet (8), the clutch opens and the cam group stops rotating.

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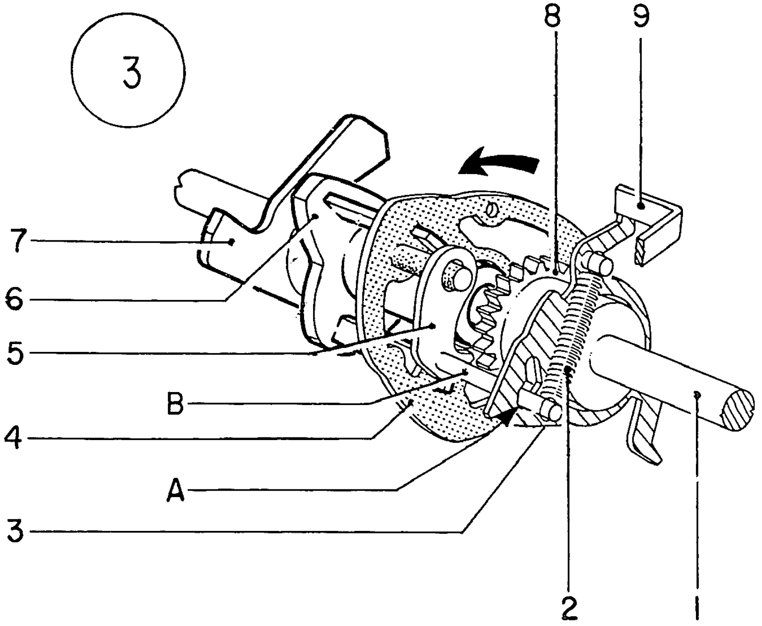

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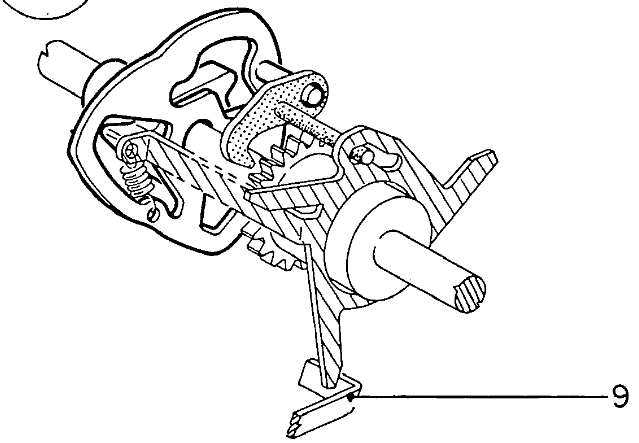

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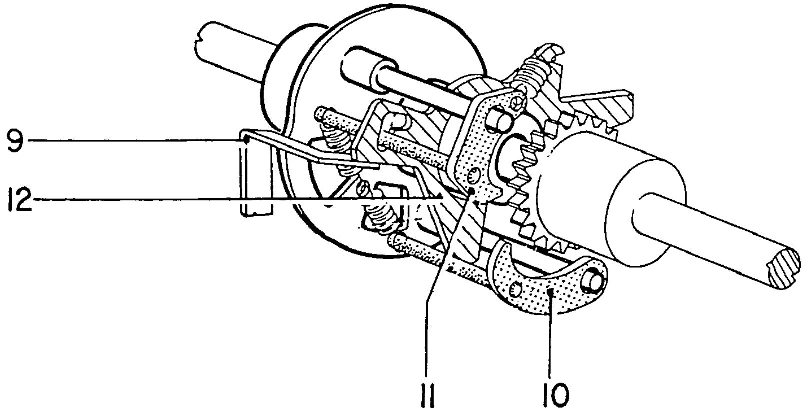

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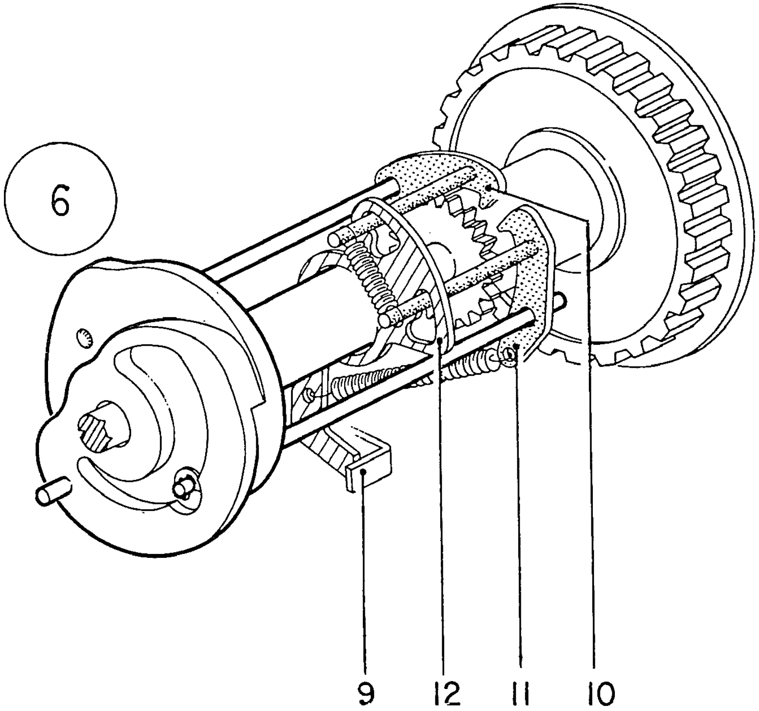

SPACING, SHIFT, AND SERVICE CAM GROUPS

Figure 4 shows the spacing cam group. The basic function of this cam group is to space the carriage when the space bar is depressed.

Figure 5 shows the shift cam group. The function of this cam group is to actuate the segment when the shift keys are depressed.

Figure 6 shows the service cam group. The basic functions of this cam group are to actuate the following:

- Carriage return
- Back space
- Half space
- Margin by-pass
- Margin set
- Express margin
- Tabulation
- Tab clear and tab set

The clutch assembly of the cam groups in figures 4, 5 and 6 operate basically the same as the one described in figure 3. The shift cam group in figure 5 shows two ratchet pawls (10 and 11) controlled by the flange (12). The service cam group in figure 6 also shows two pawls (10 and 11) controlled by the flange (9). The reason for the second pawl will be described later in Section 12 pertaining to the shift mechanism.

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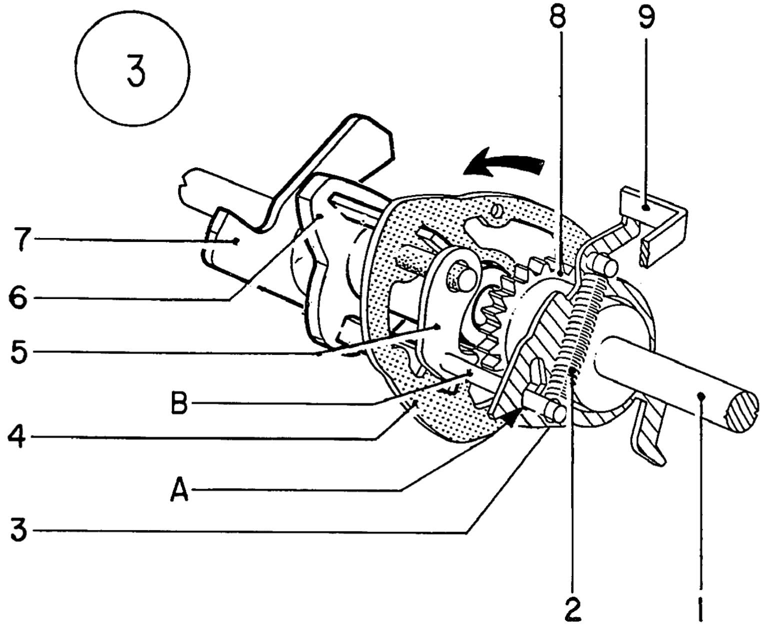

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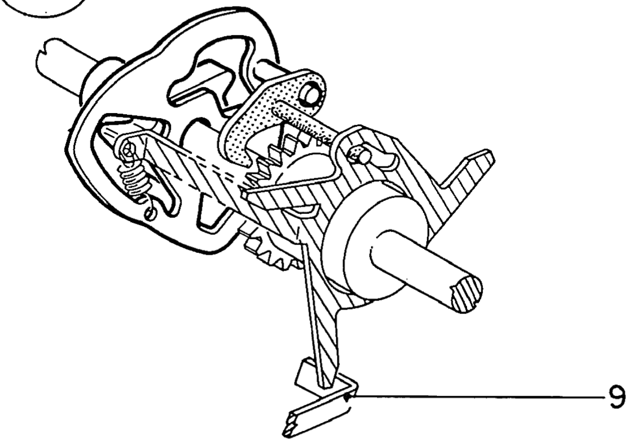

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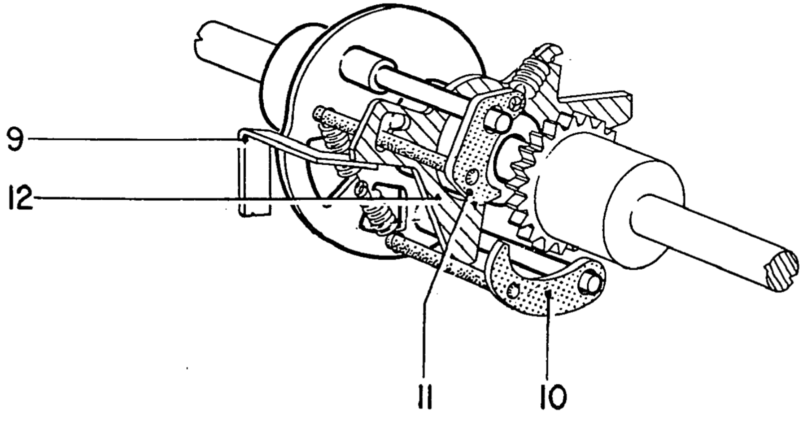

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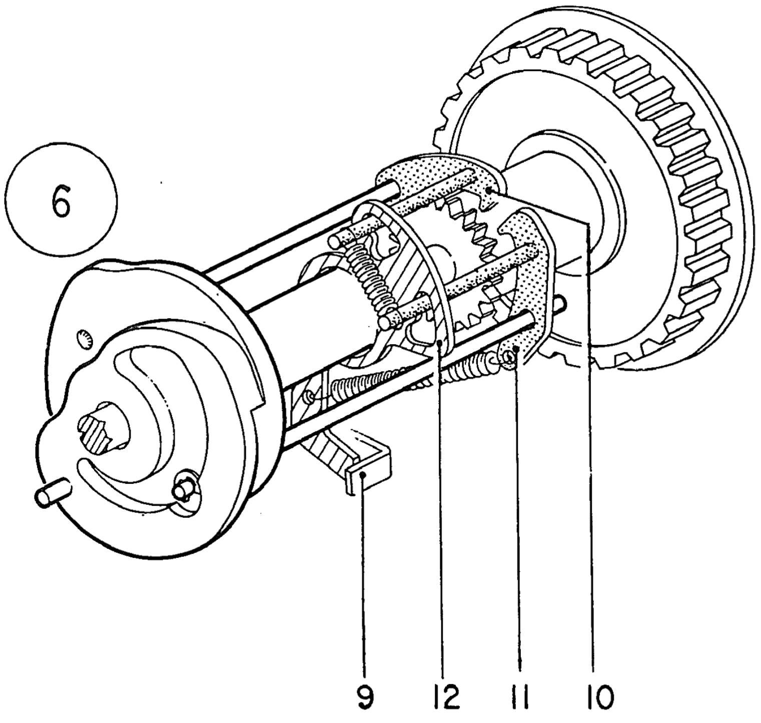


POWER SHAFT

Figure 7 shows the power shaft (4) assembled with the four cam groups. Each cam group is identified as follows:

- Service cam group (2)
- Shift cam group (3)
- Spacing cam group (6)
- Print cam group (7)

The ratchet (8) on the service cam group is different from the other three since it is part of the pulley (1). Each ratchet (8) is secured to the power shaft while each cam idles freely on the power shaft.

The carriage movement during a carriage return operation is obtained through the friction disk (A) which is attached to the right end of the power shaft (4).

ADJUSTMENTS

Power Shaft Assembly Adjustment.

The cam groups must be set to a precise lateral position, and the power shaft must be free with minimum end play.

- Position the spacing cam (6) against the retaining clip (5).

- Position the spacing cam ratchet, leaving a maximum of 0.1 mm side play to the cam. Tighten the set screws of the ratchet.

- Position the print cam (7) against the ratchet of the spacing cam. Position the print cam ratchet, leaving a maximum of 0.1 mm side play to the cam. Tighten the set screws of the ratchet.

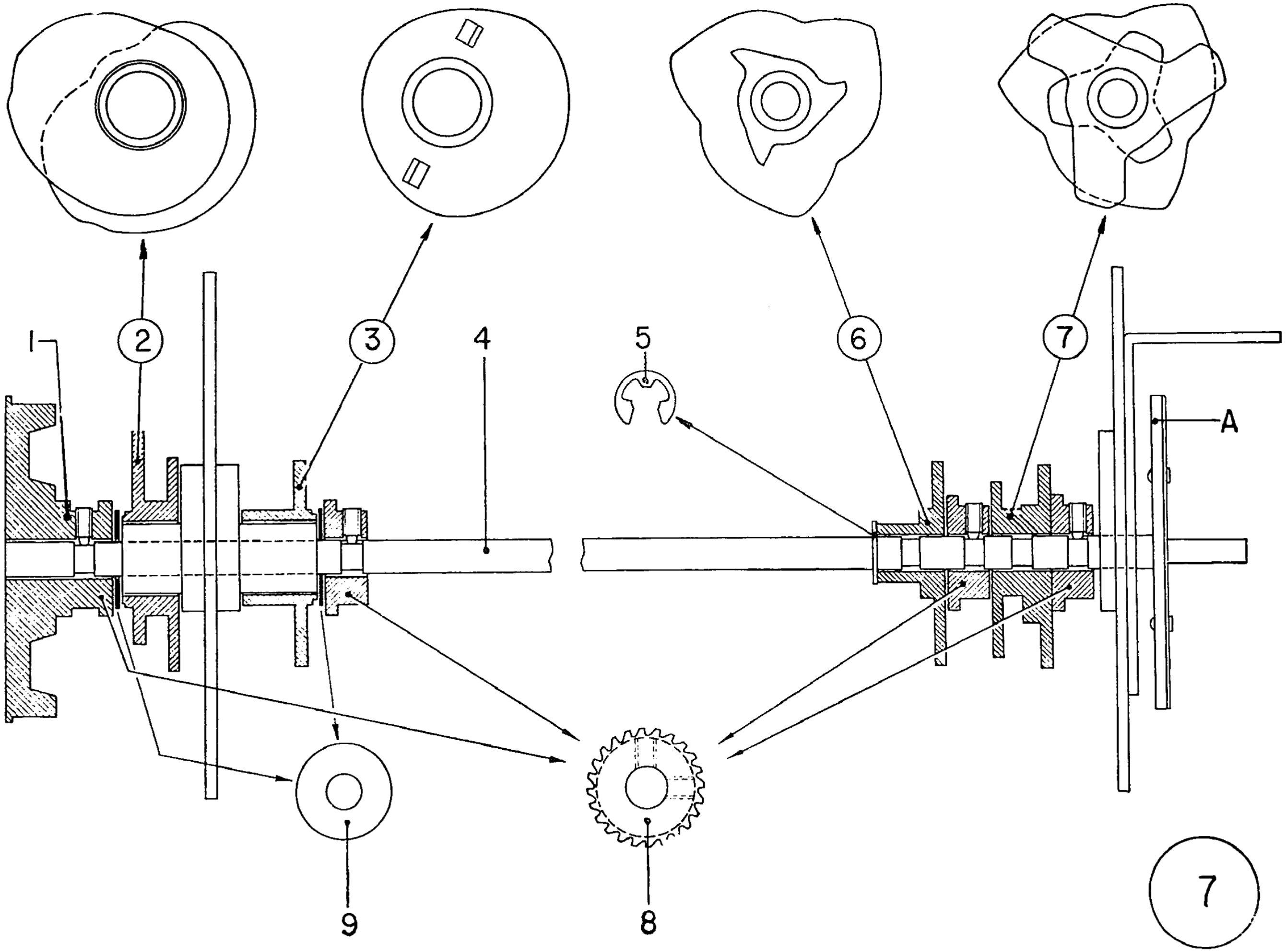
- Position the power shaft (4) laterally so that the profiles of the space cam and print cam are centered with respect to the various rollers operating on these profiles. Check that:

  - The print cam ratchet is not contacting the side plate of the machine.

  - The disk is not contacting the screws securing the bracket of the carriage return friction clutch assembly.

- With the power shaft in the position described above, position the shift cam (3) against the left side plate. Position the ratchet and washer (9) against the hub of the cam. Tighten the set screws of the ratchet.

- Position the service cam (2) and the pulley (1), leaving a maximum of 0.1 mm side play to the power shaft. Tighten the set screw of the pulley.



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SECTION 3

KEYBOARD ASSEMBLY

INTRODUCTION TO KEYBOARD ASSEMBLY

The keyboard is comprised of 45 character key levers and feature keys which are assembled in the keyboard housing.

Depressing a character key activates the "type action," and results in the printing of its respective character.

The motor switch dial has two positions: OFF and ON.

In the OFF position:

- The electrical circuit is open, and the machine is inoperative.

- All character key levers are locked. The space bar, back space, half space and carriage return keys are also locked.

In the ON position:

- The electrical circuit is closed, and the machine is operative.

- The character key levers, space bar, back space, half space and carriage return keys are unlocked and can perform their respective functions.

The keyboard assembly on the Editor 4 is a sectional portion of the machine which can be completely removed from the typewriter.

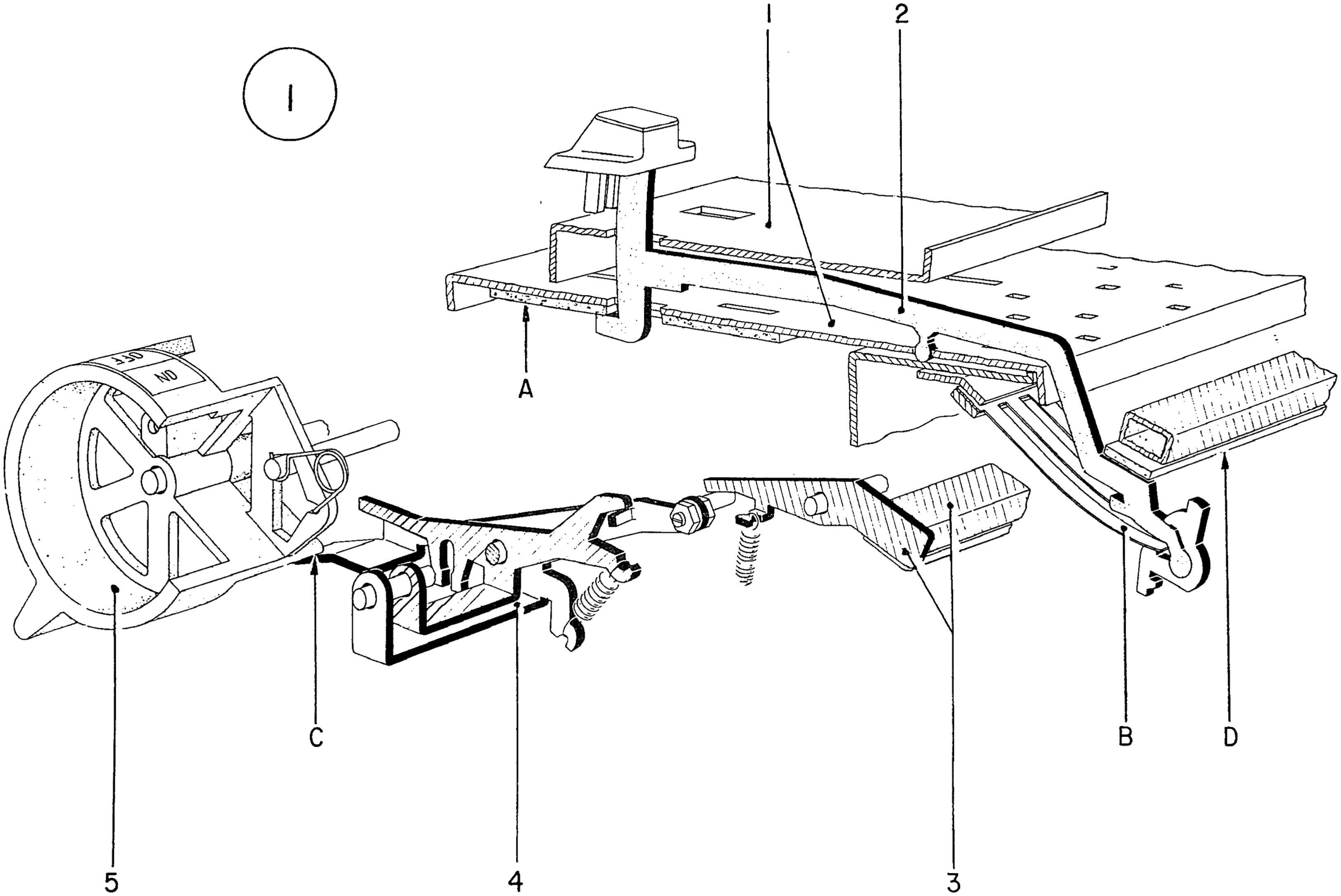
ASSEMBLY (REST POSITION)

- The keyboard assembly is secured at each end to the base frame of the machine by an eccentric locating stud and a fastening screw (not shown in the illustration).

- The key levers (2) are fitted in slots of the keyboard housing (1), and are held against the rubber stop (A) through the tension of the leaf spring (B).

MOTOR SWITCH OFF

When the motor switch dial (5) is in the OFF position, its extension (C) holds the keyboard lock control lever (4) rotated, and, in turn, holds the key lever locking bar (3) in the low position. In this position, the rubber cushion (D) of the key lever locking bar just contacts the rear of the key levers (2) and prevents the depression of any key lever controlled by the locking bar (3).


I
1
2
A
OFF
ON
C
B
D
5
4
3

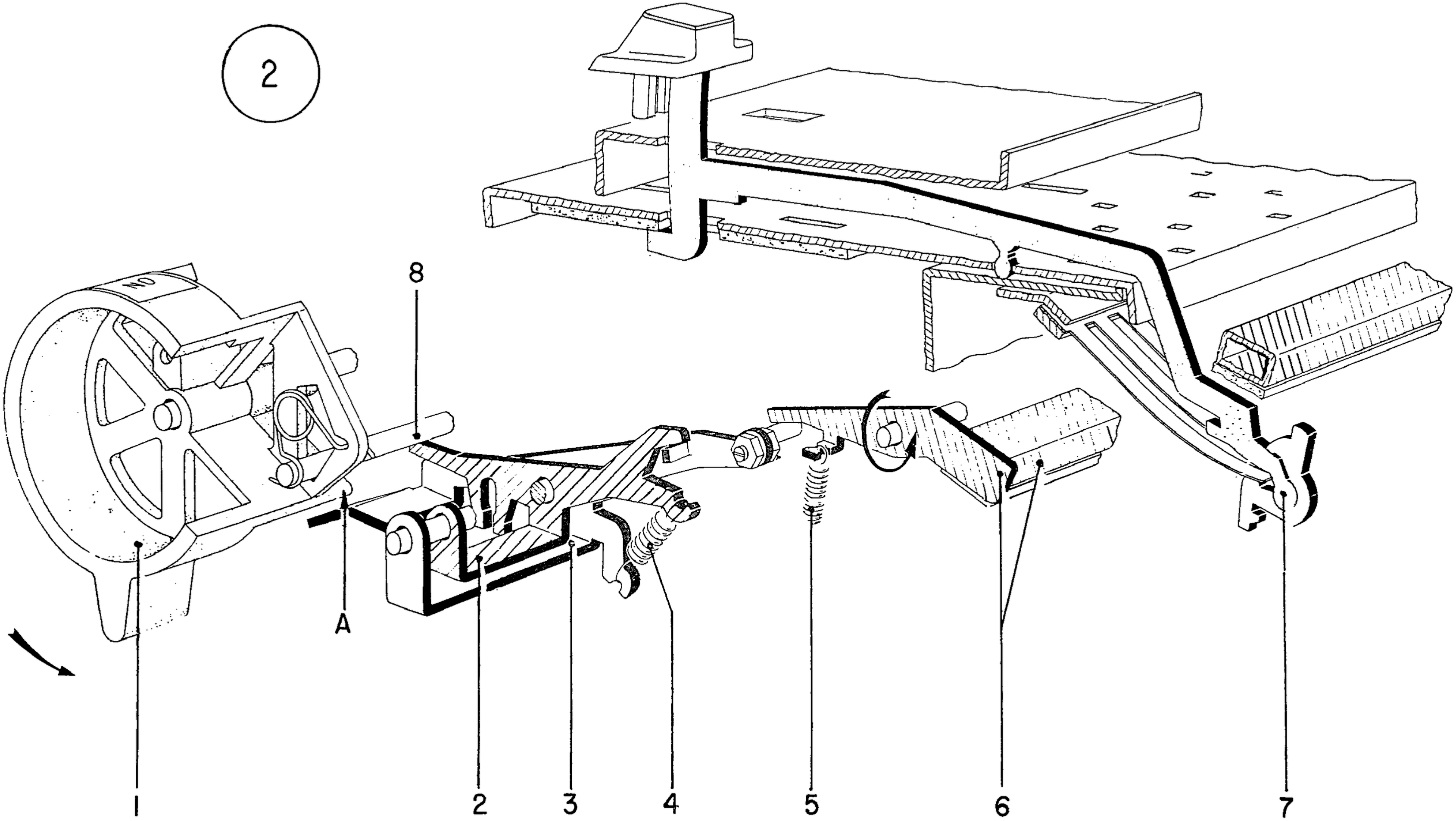
MOTOR SWITCH ON

Rotation of the motor switch dial (1) to the ON position moves the extension (A) away from the keyboard lock control lever (3). The spring (5) rotates the key lever locking bar (6) in the direction of the arrow, until the key lever locking bar positioning lever (2) limits against the stud (8).

Since the connecting spring (5) is not strong enough to overcome the tension of the spring (4), the key lever locking bar positioning lever (2) does not move in respect to the control lever (3).

With the key lever locking bar (6) in the raised position, all key levers which are controlled by the locking bar will be free to operate, and will be cushioned in their final downward movement by the yielding of spring (4).

> Note: Two adjustments of this mechanism are given in Section 5 (Printing Cycle), pages 52 and 54.


NO
A

SECTION 4

TOUCH CONTROL

INTRODUCTION TO TOUCH CONTROL

The touch control feature is provided so that the touch of the keyboard can be regulated by the operator. This is accomplished through the touch control dial which controls the amount of pressure required to operate the 45 character keys.

ASSEMBLY

The touch control device consists of the following:

- Touch control dial (2)
- Touch control actuating lever (1)
- Touch control bail with leaf springs (4)
- Detent spring (3)

The leaf springs (4) exert pressure on the extension (A) of their respective key levers. The radial position of the touch control bail (4) is controlled by the cam profile within the touch control dial (2). In the figure the touch control dial is shown in the position "L" which provides a light touch to the keyboard. In this position the letter L is visible through the opening in the front cover.

ACTIVATION

Rotation of the touch control dial (2) in the direction of the arrow will cause the actuating lever (1) to radially position the control bail (4), as the stud of the actuating lever detents into the various cam dwells of the touch control dial. This results in the leaf springs exerting a greater amount of pressure on the key levers.

Each of the five cam dwells is a different distance from the pivot point, therefore, the touch control dial can be set at any one of the five following settings:

- Light
- Medium Light
- Medium
- Medium Firm
- Firm

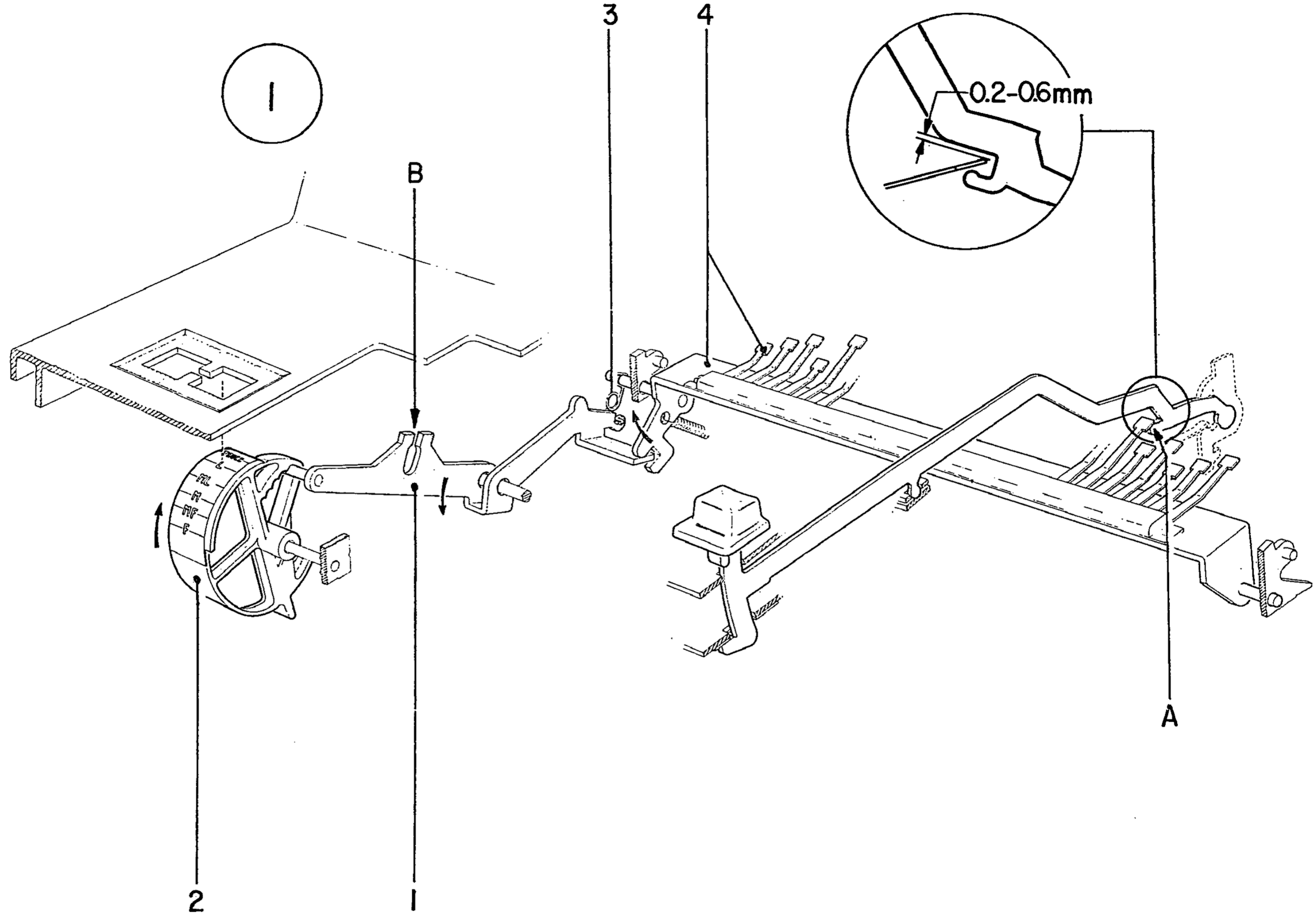
The touch control dial is detented at each position by the tension of the detent spring (3).

ADJUSTMENT

ADJUSTING TENSION OF TOUCH CONTROL

With the touch control dial set at the L (light) position, there should be a clearance of 0.2 to 0.6 mm between the prongs (4) and the bottom edge of the key levers. (Refer to detailed inset.)

To adjust clearance, open or close the U-shaped gap (B) in the actuating lever (1) until clearance for light position is within required tolerance. This adjustment ensures proper variation of touch between light and firm settings of the touch control dial.


3
4
0.2-0.6mm
1
B
L
ML
M
MF
F
A
2
1

SECTION 5

PRINTING CYCLE

INTRODUCTION TO PRINTING CYCLE

The type-action mechanism designed into the Editor 4 provides for uniform printing. The factors responsible for this result are:

- The control of the type bars as they are raised to the printing point through spring action.
- The type-action mechanism is independent of other functions.
- The individual impression control of all type bars.
- The compensation of type impact (impression) between upper and lower case characters.

The type action of the Editor 4 is completely independent from:

- External factors, such as frequency and voltage fluctuations which can vary the speed of the motor.
- Internal factors, such as ribbon lift, ribbon feed and escapement trip.

The maximum printing speed of the Editor 4 is 920 characters per minute. This results from the capability of the machine to perform three type actions for each rotation of the power shaft, which rotates at 307 rpm.

For printing to take place, it is necessary to:

- Select the proper type bar to be subsequently activated.
- Activate the print cam group (engage clutch).

During the printing cycle, the following movements occur:

- The selected type bar is raised to the printing point.
- The ribbon is lifted and fed.
- The carriage is advanced.

These operations are performed by three independent mechanisms activated by three individual profiles of the print cam group.

The three profiles of the print cam group perform the following basic functions:

- Raising of the selected type bar to the printing point.
- Raising and feeding of the ribbon.
- Spacing of the carriage.

TYPE ACTION MECHANISM

REST POSITION

- The type bar (4) is at rest on the type bar nest (5), and through the connecting link establishes the rest position of the bell crank (11). This chain of parts is maintained in position by the action of the impression control spring (13).

- Assembled on pivot studs of the bell crank (11) are the pull link latch (12) and the pull link (3), held in position by their connecting spring.

- The front wing of the latch (12) is located above the trip pawl (10) which is fitted on the rear of the key lever (9).

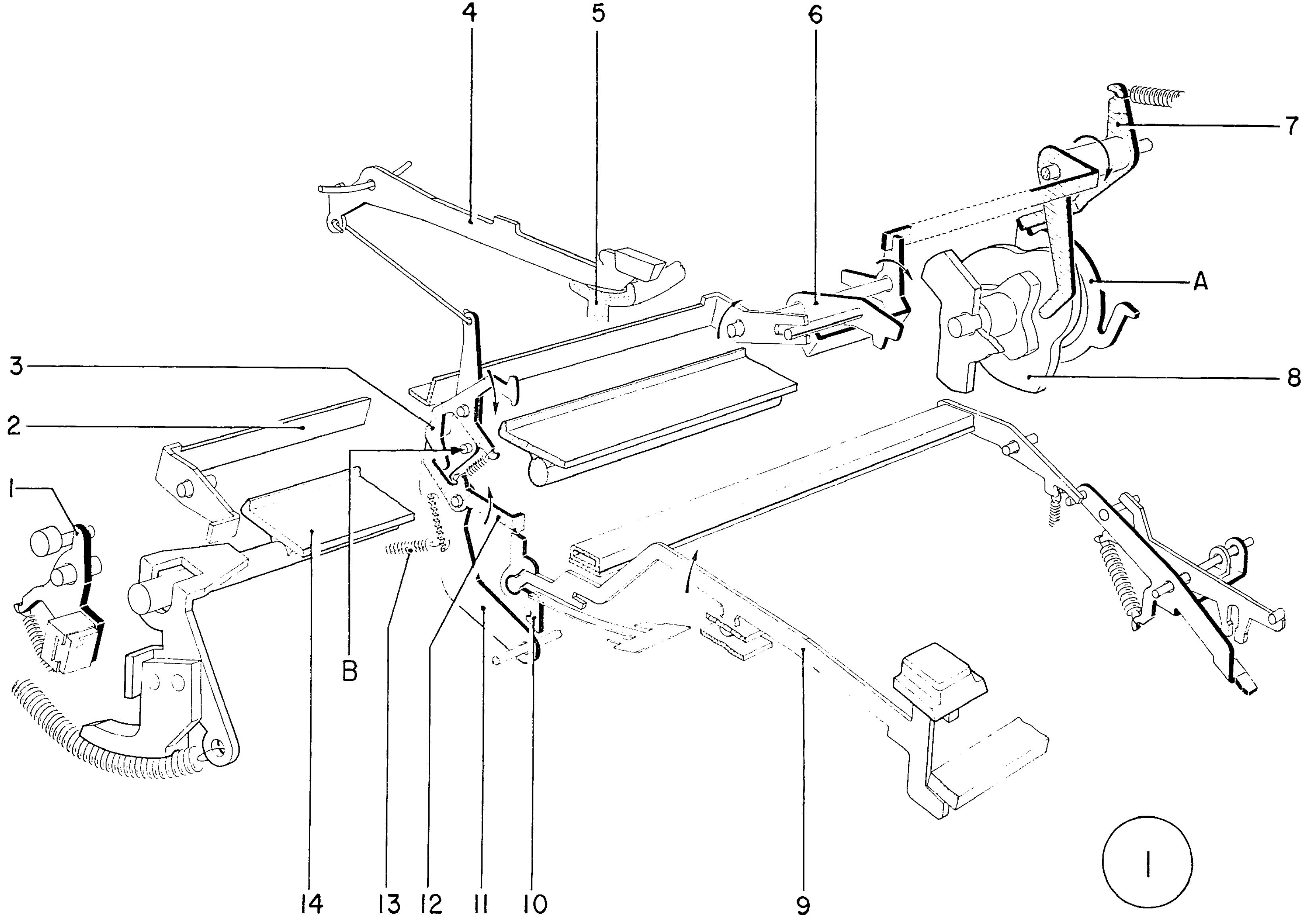
- The print cam activating bail (2) rests on the pull link (3), and its extension bridge (6) holds the wing of the starting lever (7). In this position the starting lever prevents the release of the flange (A) and the print cam group (8) is at rest.

ACTIVATION OF COMMAND MECHANISM

Depression of a key lever (9) will cause the trip pawl (10) to rotate the pull link latch (12), releasing the pull link (3), which rotates until stopped by the pin (B). In this position the pull link will:

- Place its hook in the path of the type action bail (14).

- Rotate the print cam activating bail (2) and its extension (6) in the direction of the arrows, thus releasing the starting lever (7) from the spur of the flange (A), causing the clutch to engage.

A
B

ACTIVATION OF TYPE-ACTION BAIL

The selected type bar is raised to the printing point through the action of the printing spring (2) on the type-action bail (11), under the control of the inside profile of the print cam (10).

Figure 2 illustrates the following conditions of the type-action mechanism after a character key has been depressed:

- The pull link (5) is positioned in the path of the type-action bail (11).
- The print cam activating bail has rotated, causing the print cam clutch to engage.

As the print cam starts rotating, the roller of the print cam follower (9) will move from the high point A to point B of the cam profile (figure 3). This initial movement, through the link (8) and crank (7), causes a gradual rotation of the type-action bail which engages the pull link (5) and progressively removes the slack in the linkage and slightly raises the type bar off the nest. This action eliminates:

- Violent impact of the type-action bail with the pull link.
- Vibration in the type bar which could result from sudden acceleration.
- Erratic movement of the type-action mechanism caused by slack in its linkage.

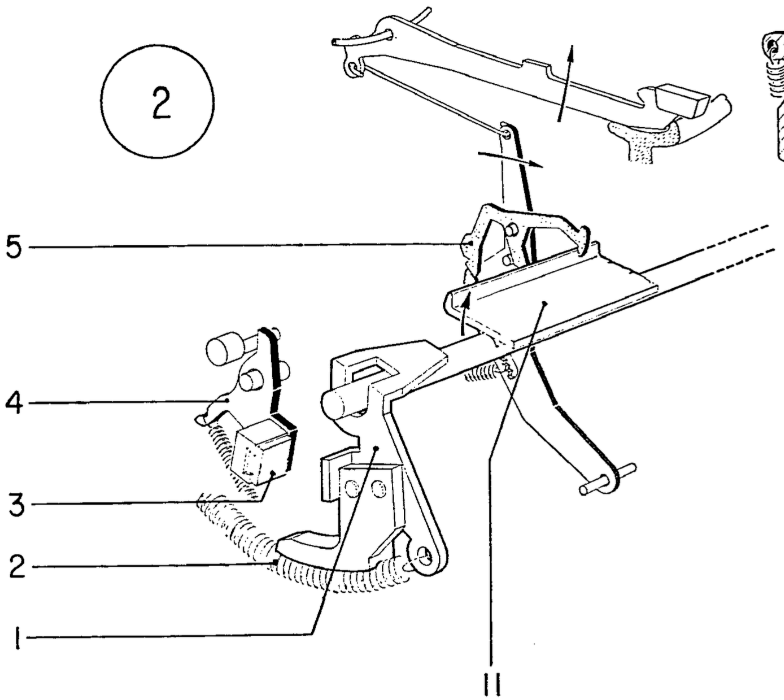
As the print cam continues to rotate, the cam follower roller moves from point B into the lower profile of the cam. Therefore, actuated by the spring (2), the cam follower (9) and type-action bail (11) can rotate rapidly, thus accelerating the type bar toward the platen. The rotation of the type-action bail stops when the bracket (1) limits against the rubber pad (3) of the bumper (4). This prevents the roller of the cam follower (9) from forcefully striking the bottom of the cam profile.

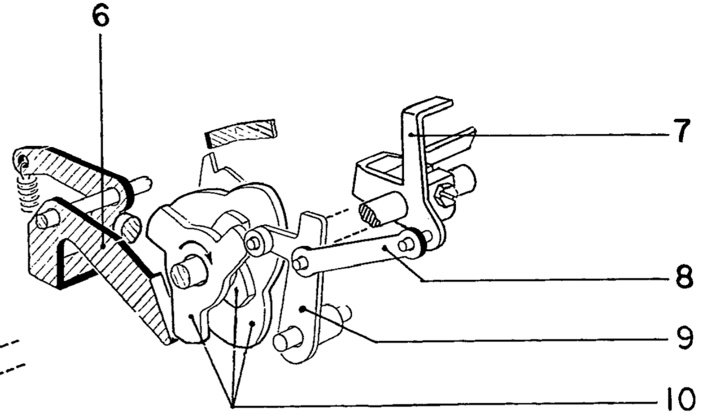
The profile D of the print cam (10) will cause the cam follower (9) to restore the type-action bail (11), and reload the printing spring (2). The print cam clutch will be disengaged when the roller of the cam follower (9) reaches A1, thus completing the printing and the reloading of the printing spring (2) in one-third revolution of the print cam.

Since the print cam is coupled to the power shaft by the clutch assembly, the rotational speed of the print cam is determined by the rpm of the power shaft. However, when the profiles B and C of the print cam passes under the roller of the cam follower (9), the pressure applied by the printing spring (2) will accelerate the rotation of the print cam (10).

A result of the increased speed of the print cam could be improper ribbon lift and keyboard deactivation when two character keys are depressed simultaneously. To prevent these conditions, the increased speed of the print cam is controlled by the braking action of the print cam shoe (6).

②





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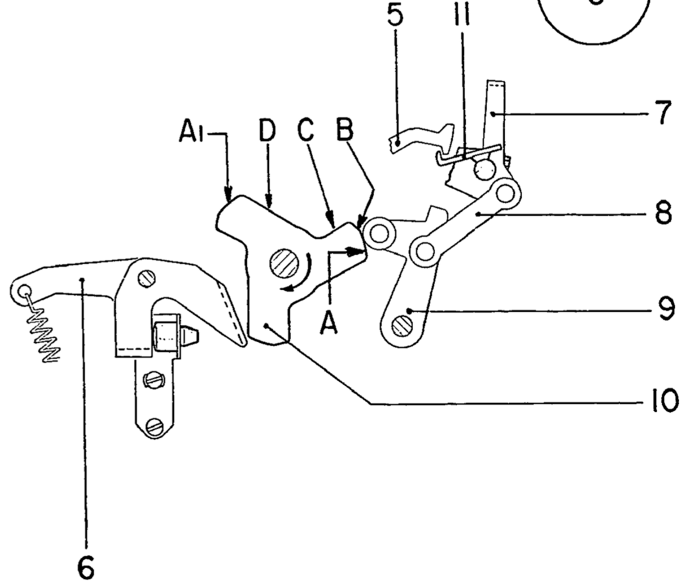


ACTIVATION OF TYPE-ACTION MECHANISM

Figure 4 illustrates the type-action mechanism at rest position.

In figure 5 a character key has been depressed and its pull link (1) is positioned over the lip of the type-action bail (2).

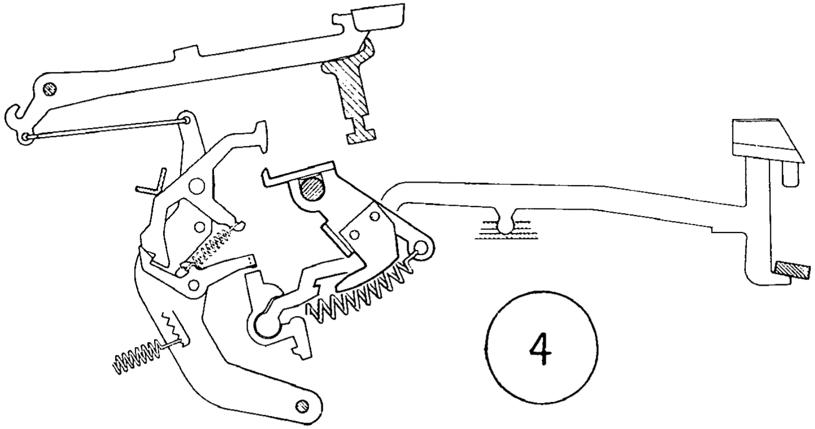
In figure 6 the type-action bail (2), under the tension of the printing spring (5), has fully rotated, and the bracket (3) has limited against the bumper pad (4). This movement raised the type bar toward the platen and also rotated the pull link (1) in a position to be relatched when the type bar returns to rest.

Figure 7 illustrates the type bar completing its travel to the platen under its own momentum. The pull link continues to move after the type-action bail has reached its maximum rotation. Just before the character strikes the platen, the type bar contacts and flexes the leaf spring (B) which:

- Leaves the type bar with sufficient force to print.

- Stores energy which will be used to initially accelerate the type bar on its return movement.

The type-action bail returns to rest, and the mechanism assumes the position illustrated in figure 4.



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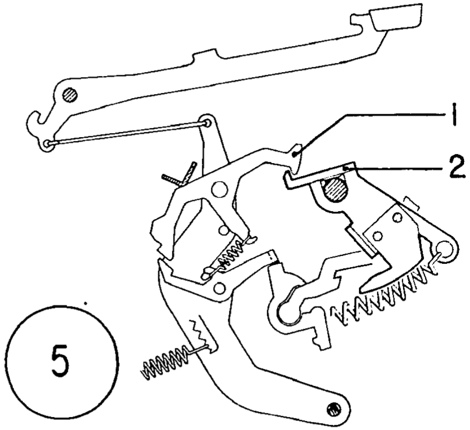

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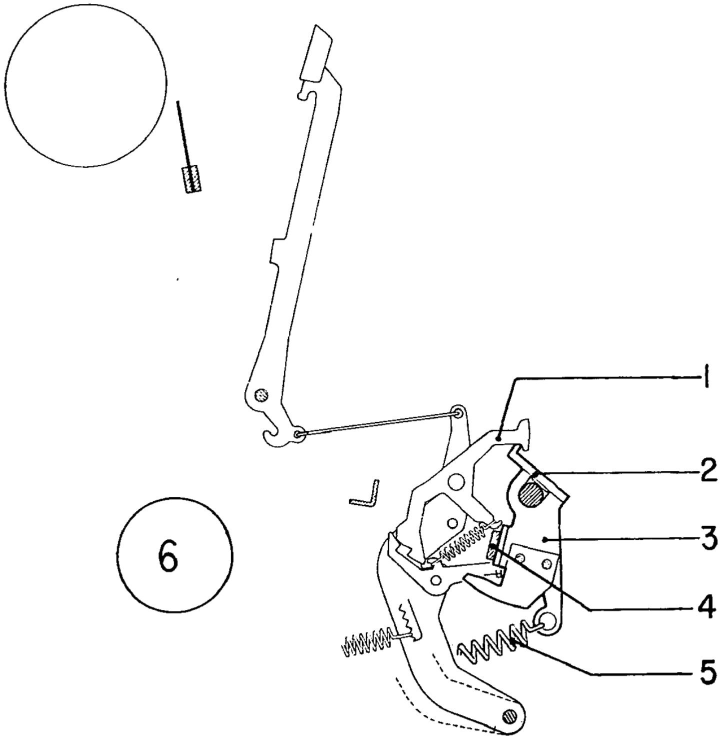

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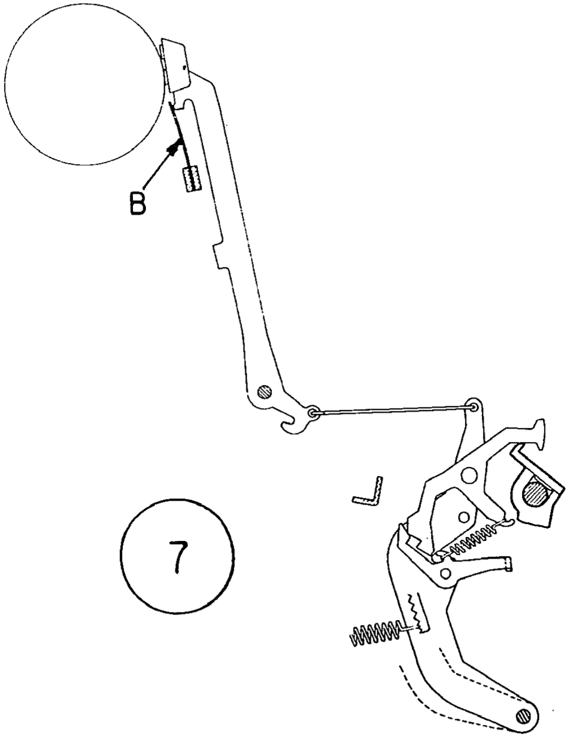

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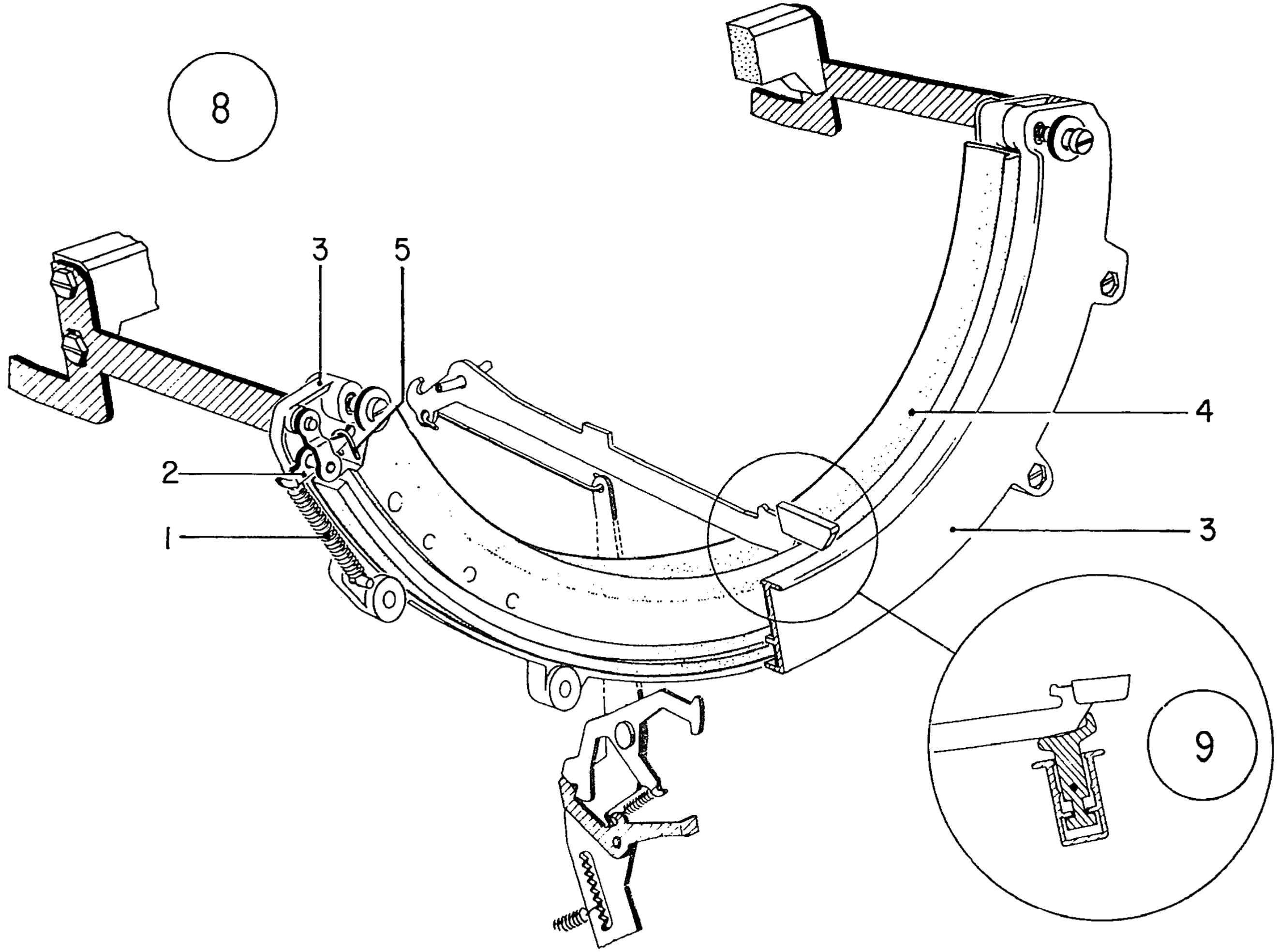
SHOCK-ABSORBING TYPE BAR NEST

The return travel of the type bars and their respective actions occur at a very high rate of speed. This is due, in part, to the leaf spring positioned behind the type guide. A shock-absorbing cushion nest is used to prevent the type bars from rebounding as they contact the nest.

The type bar nest (4) is positioned within a plastic housing (3) which is made in two halves. A silk cord (5) is attached to the hook (2) and passes through to the opposite end of the nest where it is attached to another hook. Both hooks are under the tension of a spring (1). (The spring on the right side is not shown.) The type bar nest (4) is therefore suspended between the two springs (1). When the type bars return to the nest, the springs yield, the impact is absorbed, and the type bars are prevented from rebounding.

Figure 9 shows a cross-section view of the type bar nest.



DISENGAGEMENT OF PRINT CAM CLUTCH

As a printing cycle is obtained in one-third of a revolution of the print cam, it is necessary to ensure positive stopping of the cam at the completion of the cycle. This requires the stopping of the flange (6) to disengage the clutch.

In figure 10 the clutch control mechanism is at the rest position, and the following conditions exist:

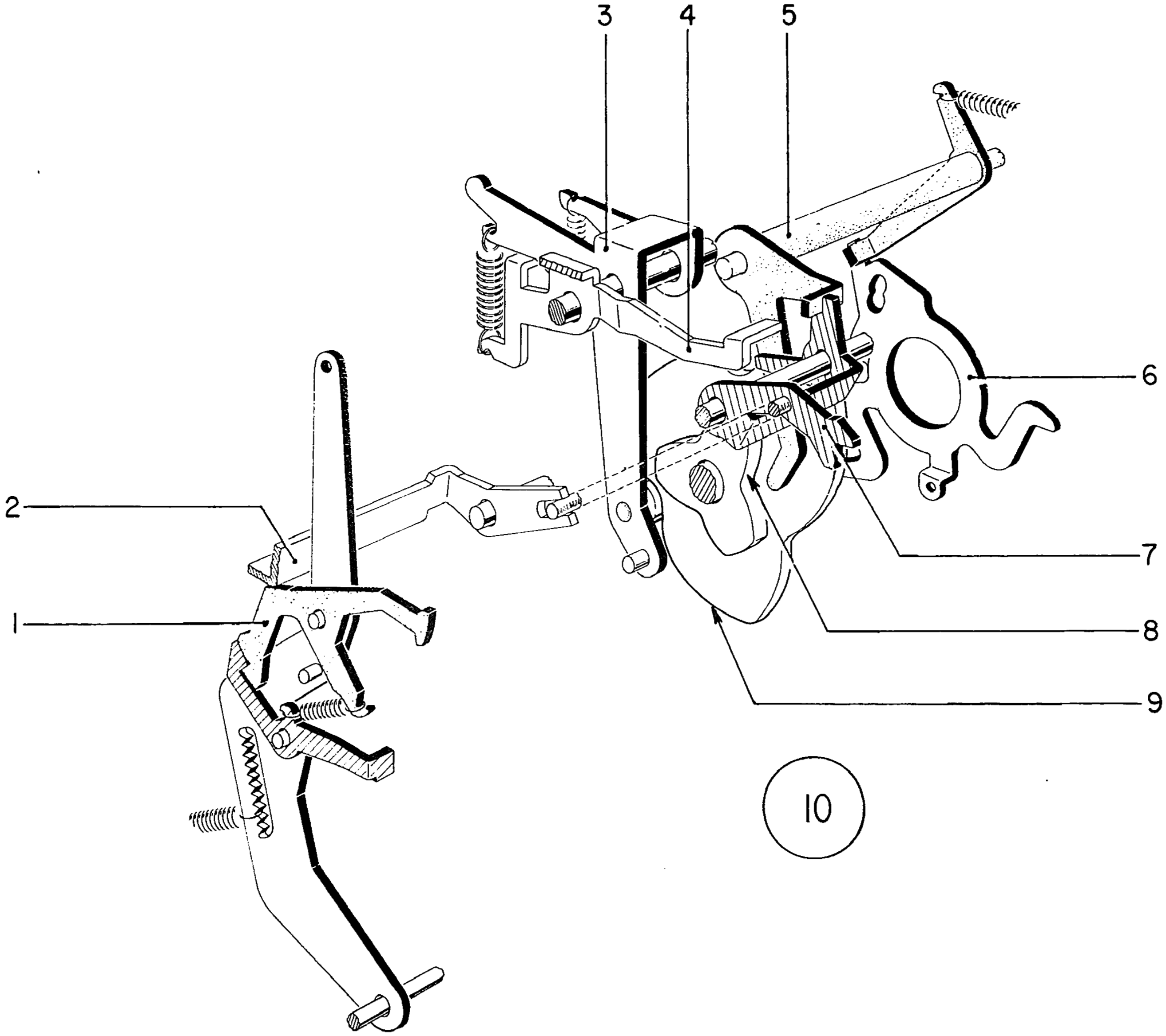
- The starting lever (5) which controls the clutch flange (6) is held by the extension bridge (7) of the print cam activating bail (2).

- The print cam activating bail rests on, and is controlled by, the pull link (1) of the bell cranks.

During the printing cycle:

- The starting lever 5 is restored by the cam profile (8).

- The print cam activating bail extension bridge (7) is restored through the restoring arm (4), and the escapement trip lever (3) by the profile (9).



⑩

Figure 11 illustrates the connection between the print cam activating bail (1) and its extension bridge (2).

Figure 12 illustrates the clutch control mechanism at rest position.

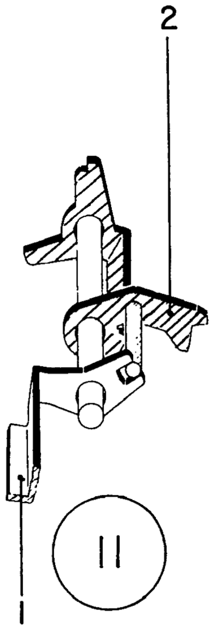
In figure 13 a character key has been depressed.

- The released pull link has rotated the print cam activating bail and, in turn, its extension bridge (2).
- The starting lever (7) has been released and rotates until its lower arm limits on the profile (8). As a result, the clutch is closed and the print cam starts to rotate.

In figure 14 the starting lever (7) has been rotated to its maximum restored position by the profile (8). In this position, the starting lever can stop the cam after 120 degrees of rotation. The profile (3) is restoring the extension (2) through the trip lever (4) and the restoring arm (6).

Figure 15 illustrates the position of the mechanism near the end of the printing cycle.

- The extension (2) of the print cam activating bail has positively been restored through the cam profile (3), trip lever (4) and restoring arm (6). The coupling spring (5) between the trip lever and restoring arm has stretched slightly.
- The starting lever (7) has returned to rest on the step of the print cam activating bail extension (2).
- At the completion of the cycle, the mechanism will assume the position illustrated in figure 12.



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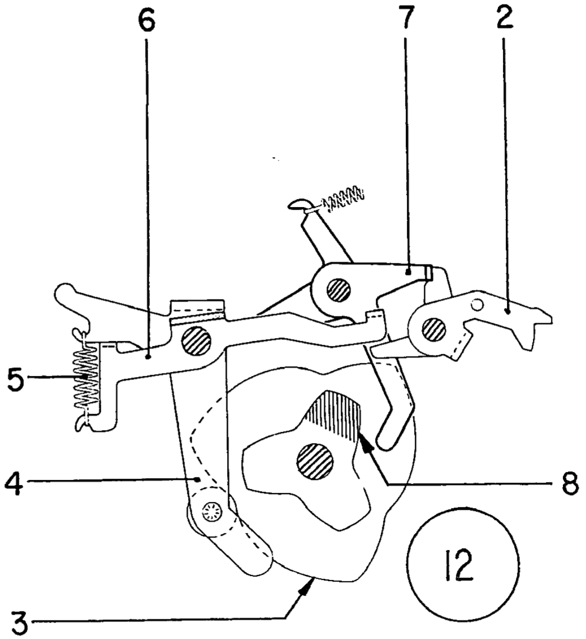

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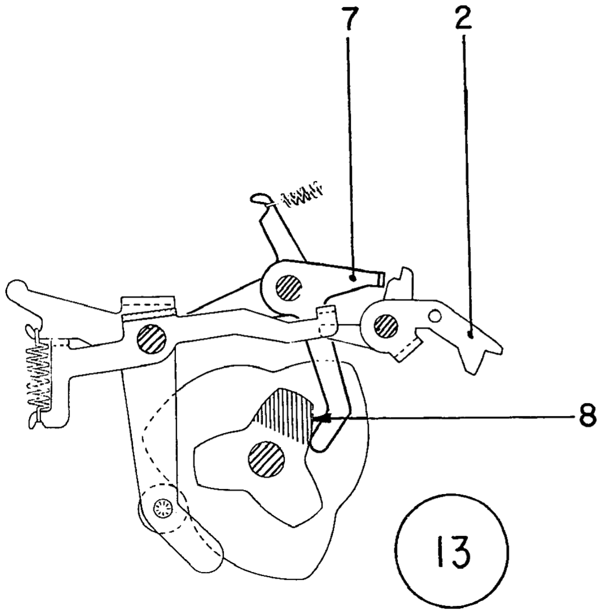

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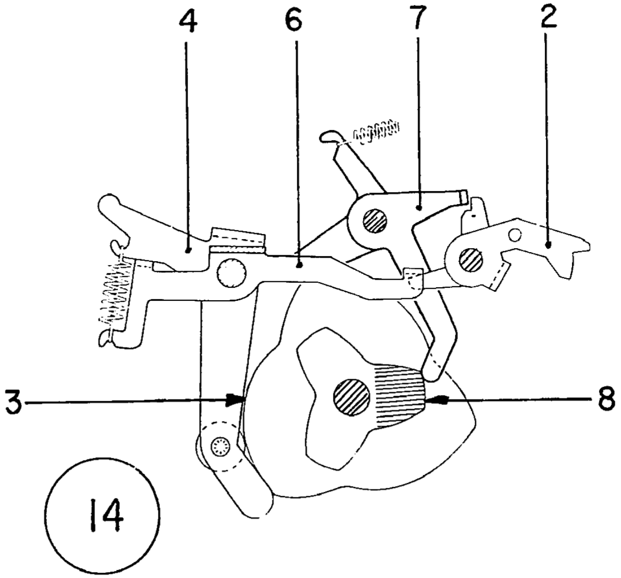

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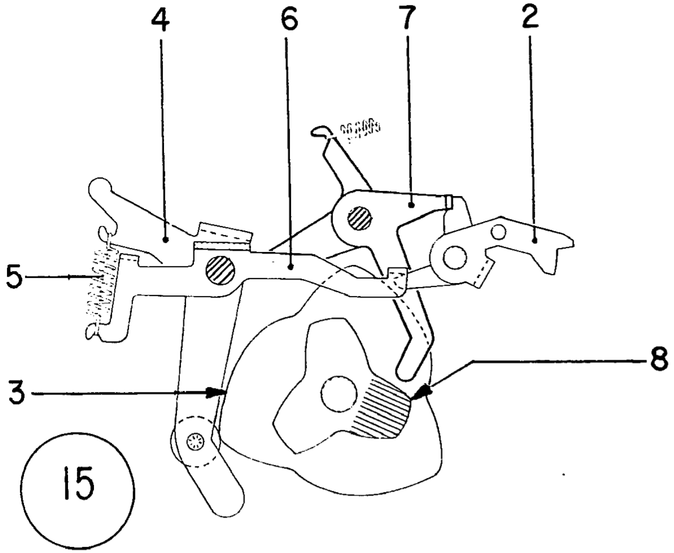


15

ADJUSTMENTS

The vertical position of the segment is adjustable in order to attain correct type-on-feet and motion. The front to rear position of the segment is determined by the carriage fixed rail assembly which has been positioned between the two side plates of the machine with special gauges at the factory.

REST POSITION OF TYPE BARS AND BELL CRANKS ADJUSTMENTS (Figures 16 and 17)

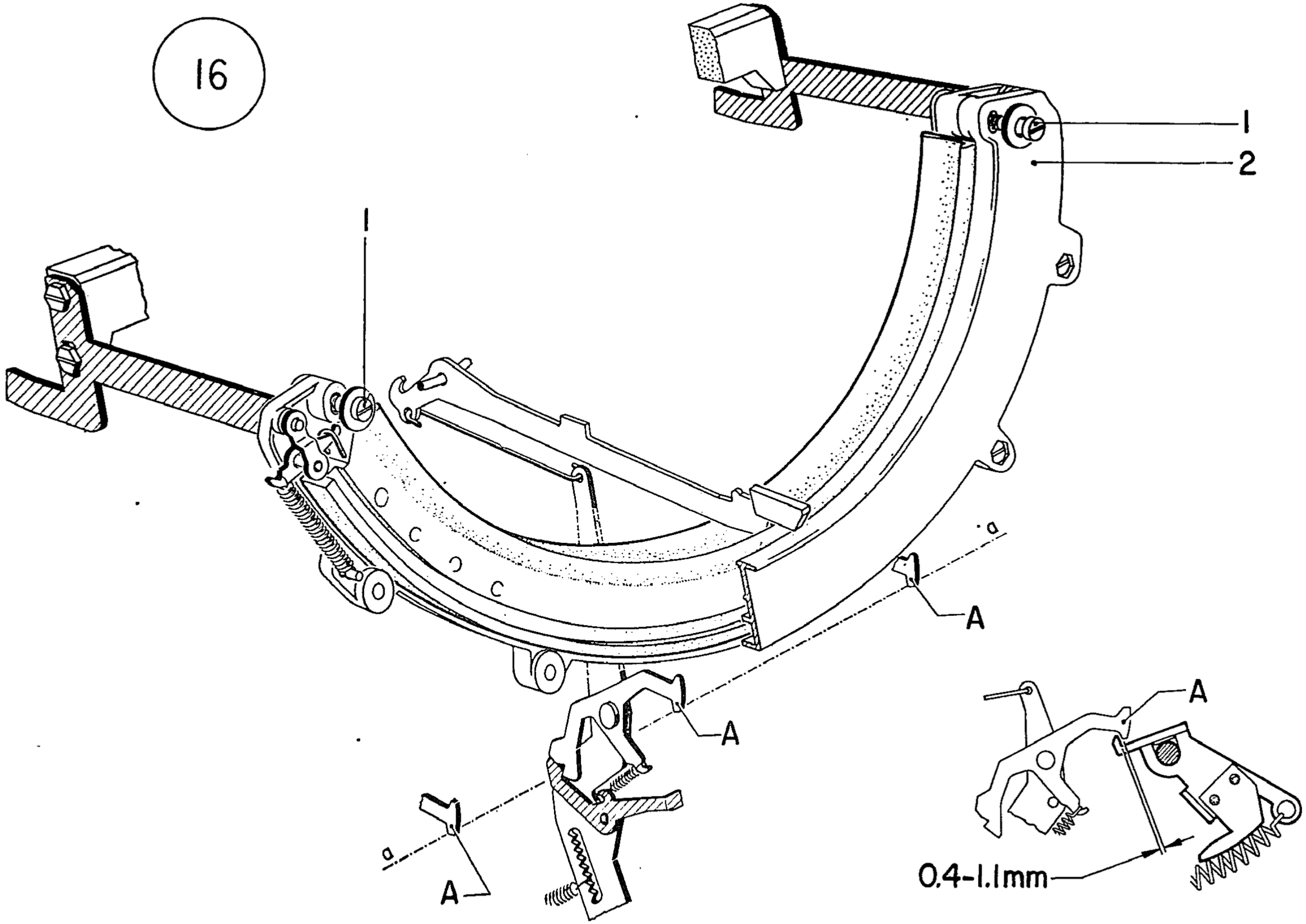
The rest positions of the type bars and the bell cranks are established by the type bar nest.

Perform the following to check the rest positions:

- With the type bar nest fully restored upward by its side springs, check that the following conditions are present:
  - With the type bars at rest on the nest, the type slugs must not touch each other.
  - The heads (A) of all the pull links must align perfectly parallel with the lip of the type-action bail as indicated by the line (a - a) in figure 16.
- Release several pull links at both ends and in the center.
- Check that a horizontal clearance of 0.4 - 1.1 mm exists between the pull links and the type-action bail (figure 17).

To obtain the required clearance, loosen the screws (1) and position the type bar nest assembly (2) up or down, as required.

16



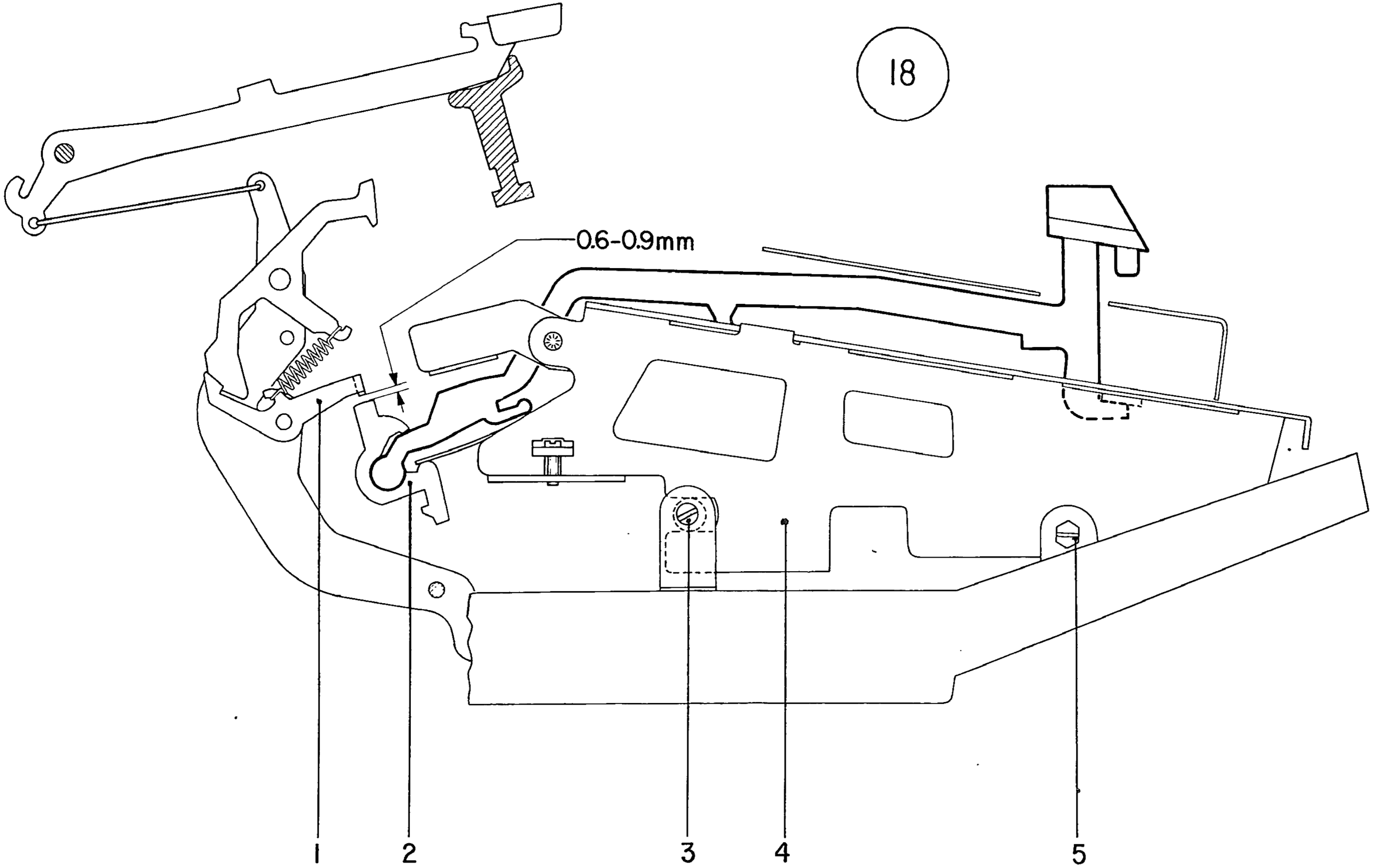
17

KEYBOARD UNIT ADJUSTMENT

The keyboard unit (4) is a sectional portion of the machine which can be completely removed from the typewriter. The entire unit can be adjusted to attain a vertical clearance of 0.6 to 0.9 mm between each of the trip pawls (2) and their respective pull link latches (1).

To obtain the required clearance:

- Loosen the screw (5), and the lock nut (not shown) on the eccentric screw (3) on both left and right sides of the keyboard.
- Adjust the eccentric screws (3) to obtain the required clearance.
- Tighten the lock nuts and screws (5).

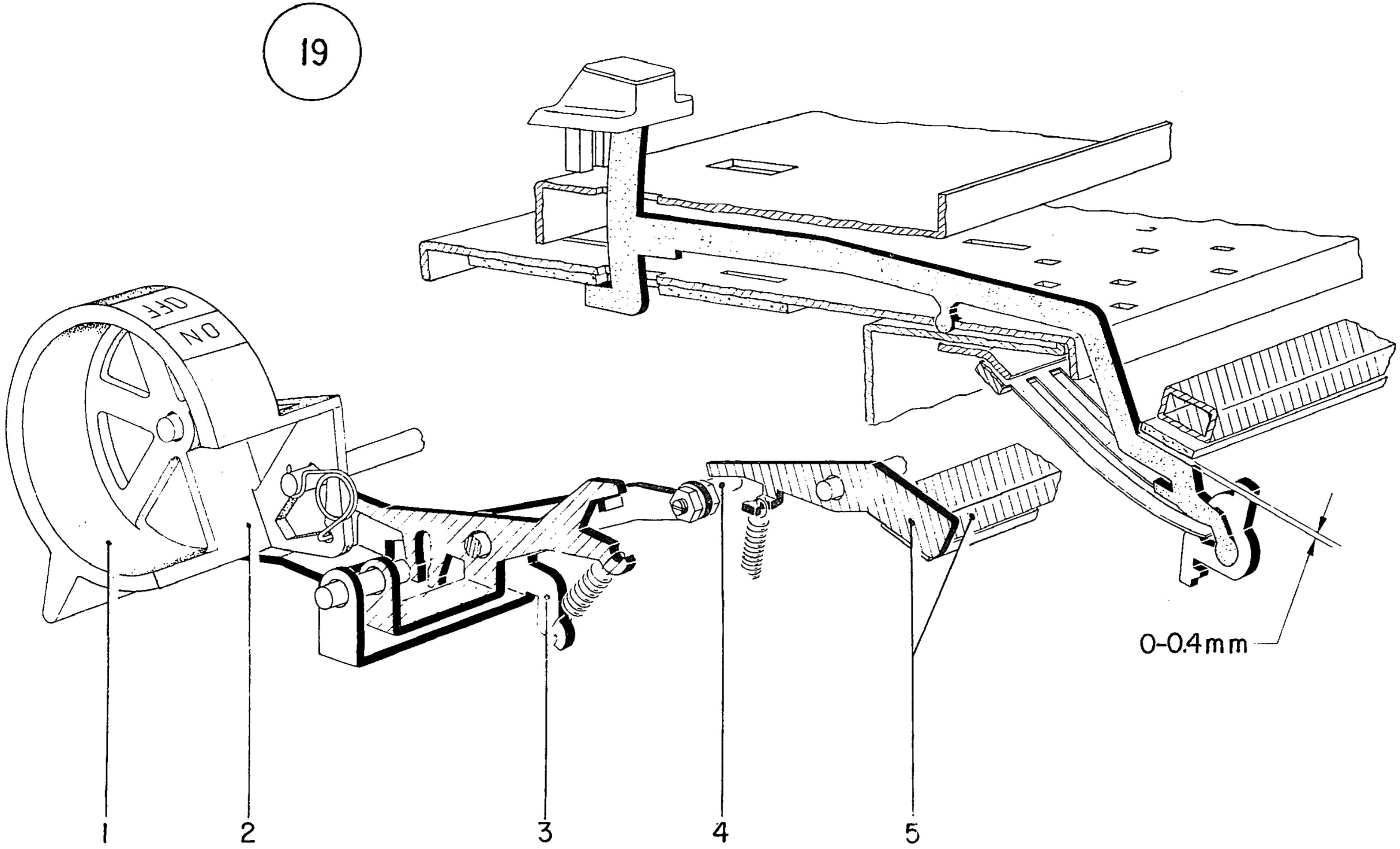

0.6-0.9mm

KEY LEVER LOCKING BAR (MOTOR SWITCH OFF) ADJUSTMENT

With the motor switch dial in the OFF position, the key levers must be locked and prevented from releasing any of the pull links.

When the motor switch dial (1) is moved to the OFF position, its extension (2) should rotate the lock control lever (3) and, in turn, lower the locking bar (5) within 0 to 0.4 mm of all the key levers.

To obtain the required clearance, adjust the eccentric (4) as required.


OFF
ON
0-0.4mm

KEY LEVER LOCKING BAR (MOTOR SWITCH ON) ADJUSTMENT

When the motor switch dial is in the ON position, the key levers must be free to activate the type-action mechanism. Check this as follows:

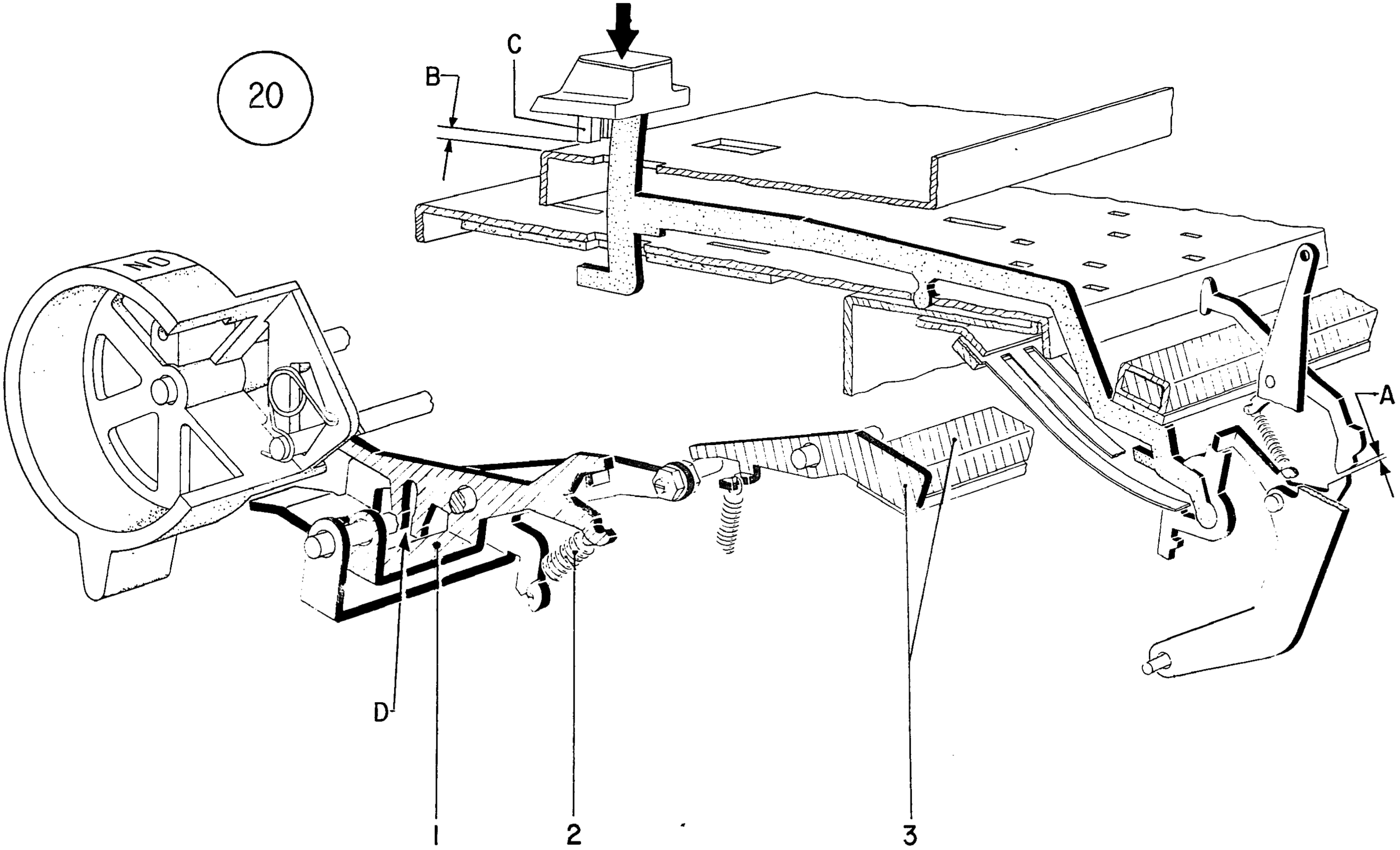
- Place the motor switch dial in the ON position.

- Slowly depress a non-repeat character key and check that the pull link latch releases the pull link when the rear of the key lever is about 0.2 mm from the rubber pad of the key lever locking bar (3). This clearance (A) indicates that the key lever can release its respective pull link.

- With the non-repeat key depressed to where it just contacts the key lever locking bar, there should be a clearance (B) between the extension (C) of the keytop and the keyboard top plate. Also observe that the spring (2) stretches a little.

- Make this check for several key levers at both ends and at the center of the keyboard.

To obtain the above conditions, open or close the slot (D) in the positioning lever (1). Recheck the adjustment.


20
C
B
ON
A
D
1
2
3

TYPE-ACTION BAIL (REST POSITION) ADJUSTMENT (Figures 21 and 22)

The rotation of the type-action bail must:

- Initially take up the play in the respective type-action mechanism.
- Raise the type bar to the printing point.

The angular rest position of the type-action bail will now be considered, since the proper position of the bell cranks and their pull links has been established.

End Play and Lateral Position.

The maximum end play of the type-action bail (5) should be 0.2 mm. Its lateral position must be such that it will engage all 45 pull links.

To adjust, position the type-action bail pivot screw (10) left and right, as required.

Vertical Clearance.

There should be a vertical clearance of 0.5 to 1.5 mm between the type-action bail (5) and the pull link head (A) when in a tripped position (figure 21).

To adjust the vertical clearance, loosen the clamp screw (11) and adjust the angular position of the type-action bail (5) in respect to the pull link (A). Tighten the clamp screw.

PRINT CAM SHOE ADJUSTMENT (Figure 21)

At full rest position the print cam shoe (13) must clear the print cam (7) between 0.2 to 1.0 mm. This will ensure that the rest position of the cam is not altered by the print cam shoe. When the profile (B) passes under the roller of the cam follower (6), the print cam should just start to contact the shoe (13).

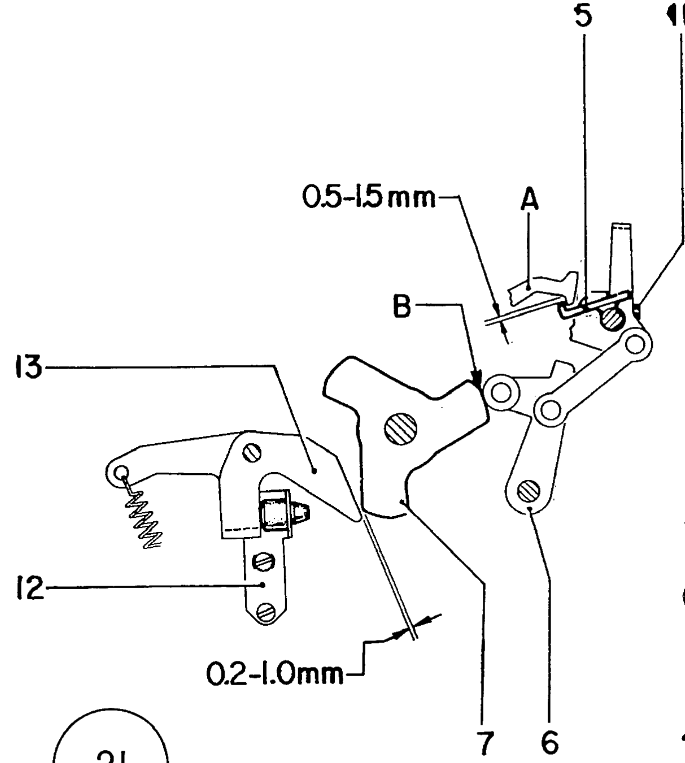
To adjust clearance, position the cam shoe bracket (12) backward or forward, as required.

TYPE-ACTION BAIL (ACTIVE POSITION) ADJUSTMENT (Figures 22 and 23)

At rest, the type-action bail is controlled by the print cam. Once the printing cycle is started, the cam ceases to control the type-action bail and is free to rotate rapidly under the tension of the printing spring (1). The rotation of the type-action bail is stopped by the shock-absorber (3) rather than by the bottom of the dwell in the cam. As a result, rebounding of the cam follower and noise are eliminated.

To adjust:

- Start a print cycle and stop when the position illustrated in figure 22 is reached.
- In this position, adjust the eccentric(4) so that the pad (2) of the shock-absorber (3) limits the type-action bail (5) to attain the following clearances (figure 23):
  - A small amount of clearance (D) between the roller (C) of the cam follower (6) and the bottom of the dwell in the cam (7).
  - 0.5 to 1.2 mm between the input control latch (9) and the starting lever (8).



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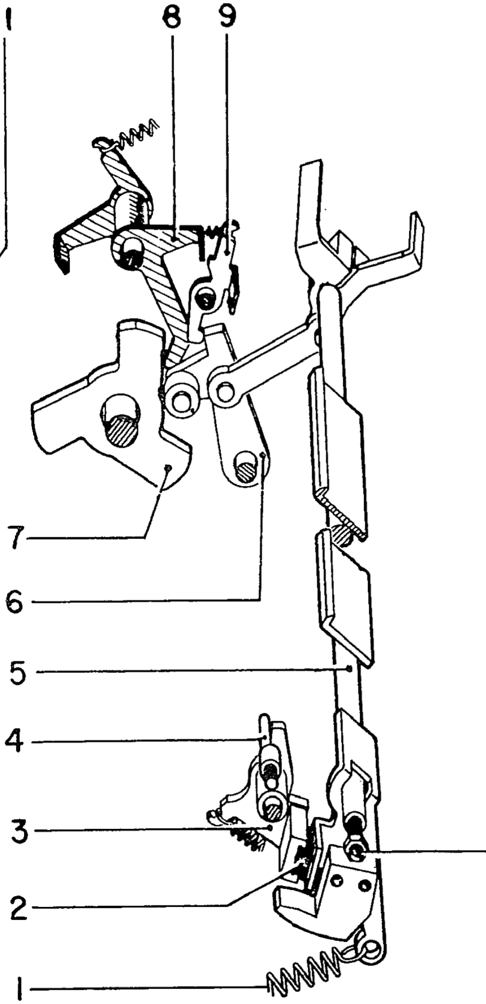
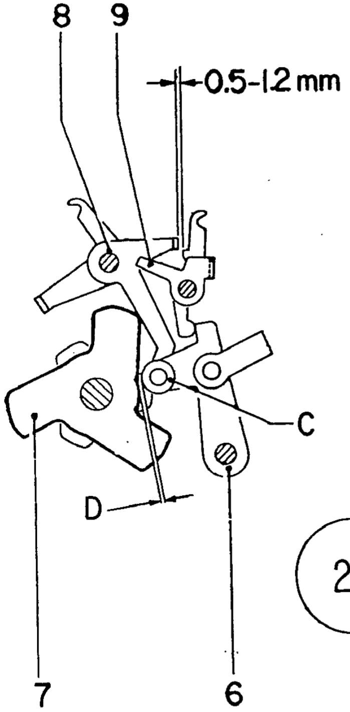


22



23

SECTION 6

REPEAT CHARACTER KEYS

INTRODUCTION TO REPEAT CHARACTER KEYS

In the course of normal typing, there is frequently a need to repeat certain characters a number of times. For example:

- The underscore, which can be used to underline a word, phrase, or sentence.

- The period, which can be used for dotted lines, diagrams, etc.

The repeat keys provide the automatic repetition of the chosen characters or symbols.

COMMAND MECHANISM

When a repeat key is held depressed, the following actions result:

- The pull link is initially unlatched, and automatically unlatches again near the completion of each repeat cycle.

- The print cam clutch engages and automatically reengages near the completion of each repeat cycle.

ASSEMBLY

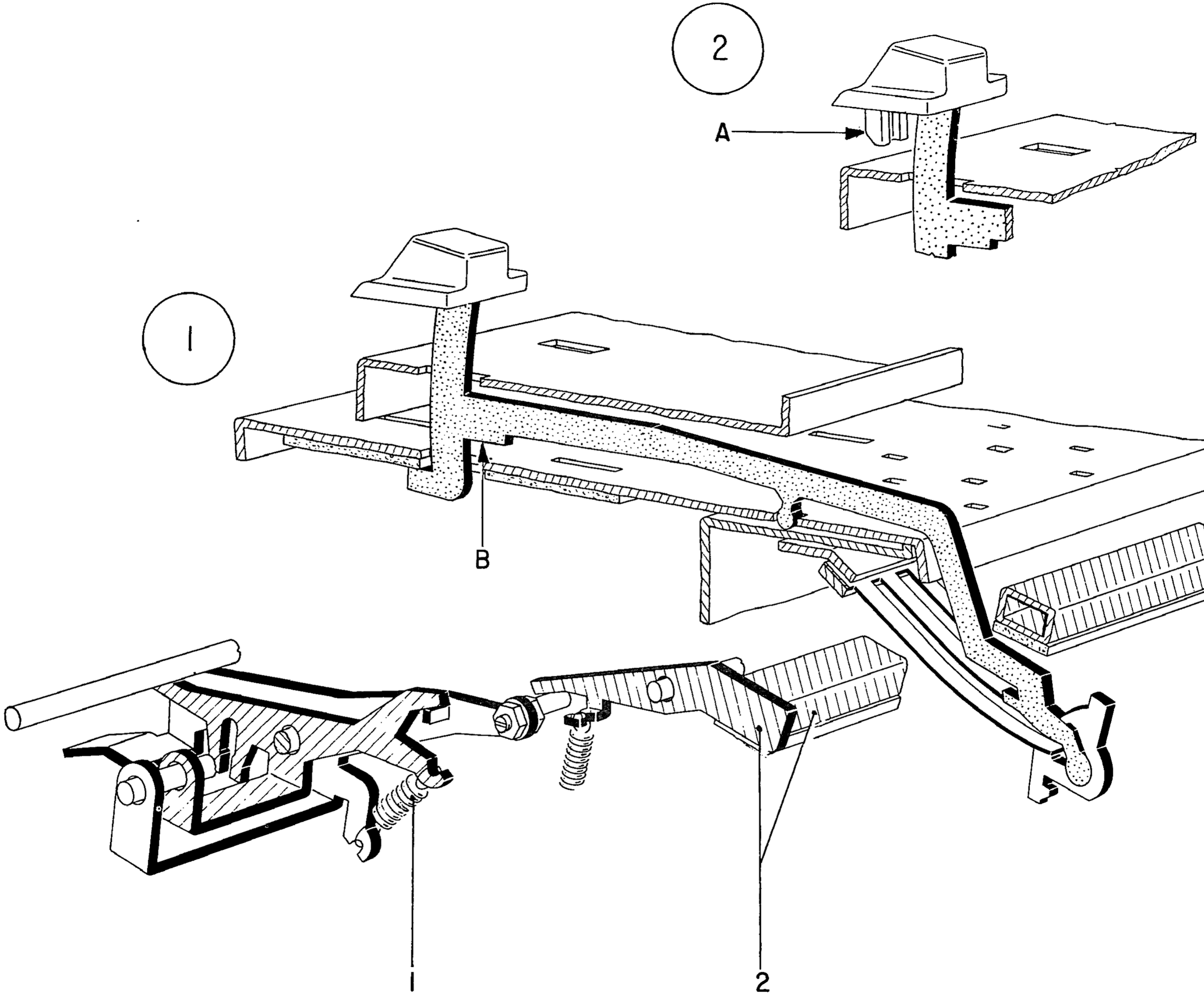
The repeat action is obtained by the same mechanism which provides regular typing.

A repeat character key can be depressed a greater distance than a non-repeat character key. It does this because:

- All non-repeat character key tops have an extension (A) which limits the final downward movement of the respective key lever (figure 2).

- Repeat character key tops do not have the extension (A) and, therefore, can be depressed further until the projection (B) of the key lever limits on the keyboard plate (figure 1).

Full depression of a repeat key will cause the key lever locking bar (2) to rotate a greater amount, causing the connecting spring (1) to yield.


②
A
①
B
1
2

ACTIVATION OF REPEAT KEY

Figure 3 illustrates a full depression of a repeat key lever (5). The trip pawl (8) has rotated the latch (4) a greater distance than for non-repeat action, and has released the pull link (2), therefore:

- The pull link is in the path of the type action bail (6).

- The print cam activating bail (1) released the clutch, causing the print cam to engage.

Figure 4 indicates that the type bar is being raised. During this movement, the pull link (2) is relatched in the same manner as during a single-action print cycle.

Figure 5 indicates that the type bar has started to return to the nest. The pull link (2) is latched by the pull link latch (4), the wing of which is now controlled by the profile of the trip pawl (8).

Figure 6 indicates that the type bar has almost returned to the nest. In this position, the bell crank (7) causes the pull link latch (4) to rotate the trip pawl (8). Rotation of the trip pawl (8) pivots the pull link latch (4) as indicated by the arrows. Because of the high position of the trip pawl, this action automatically releases the pull link (2).

Figure 7 illustrates the type bar mechanism at the completion of a repeat cycle:

- The pull link (2) is again released.

- The print cam activating bail (1) is raised, and has released the print cam clutch for the next cycle.

This action will continue as long as the repeat key is held fully depressed.

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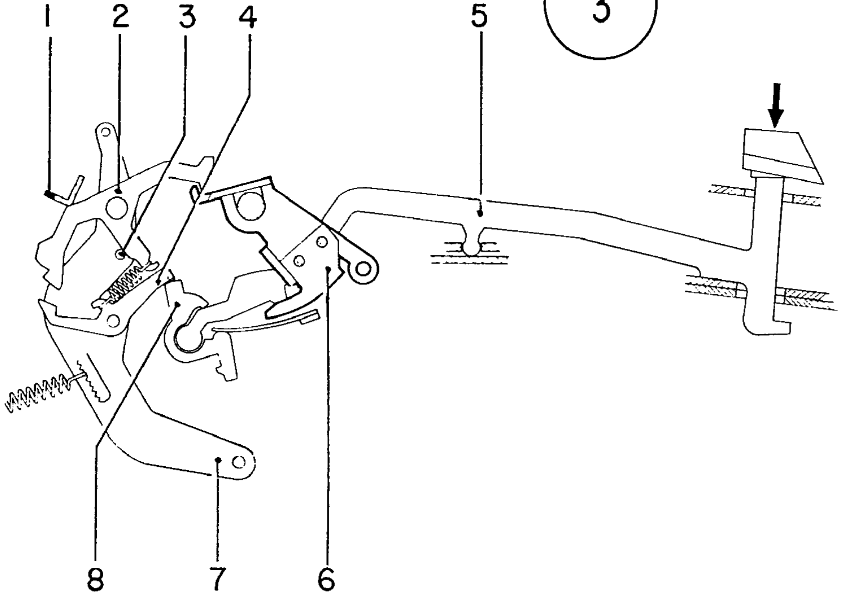

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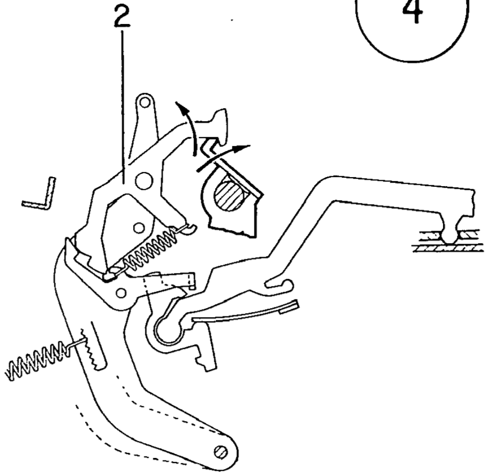

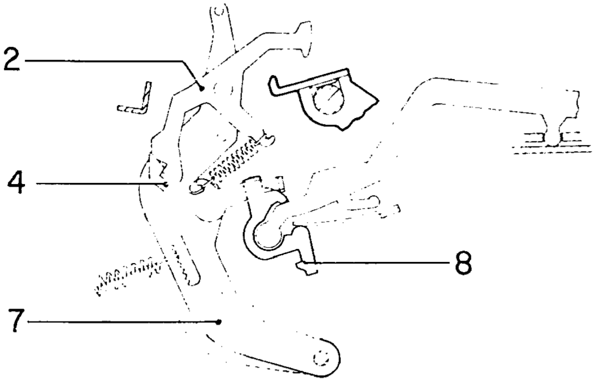

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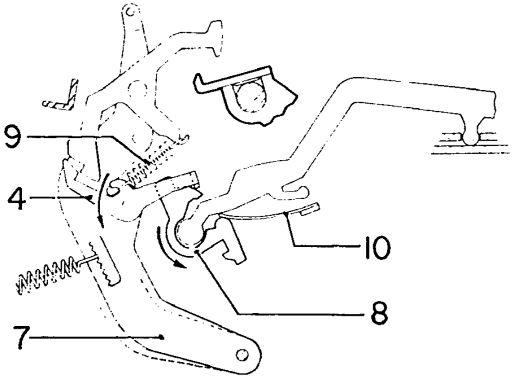

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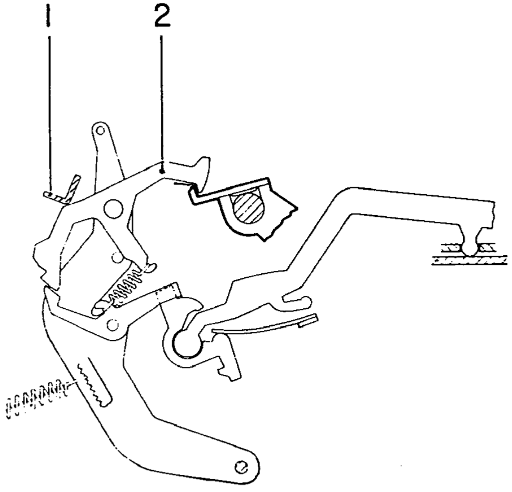

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SECTION **7**

IMPRESSION CONTROL

INTRODUCTION TO IMPRESSION CONTROL

The impression control feature provides the operator with the selection of four different ranges of typebar impression. The impression setting which the operator chooses depends upon the number of copies to be made.

The impression control setting ranges are:

- 1-4 copies
- 5-8 copies
- 9-12 copies
- 13+ copies

The type bar moves to the platen through the type action bail (8) and the tension of the printing spring (9). By varying the tension of the printing spring, the force or impact with which the type bar strikes the platen is also varied. The rotation of the copies control dial (1) changes the tension of the printing spring.

ASSEMBLY (REST POSITION)

The printing spring (9) is attached between the arm on the left end of the type action bail (8) and the adjustable anchor (5). The anchor is attached to the impression control arm (6) which is controlled by the detent crank (7).

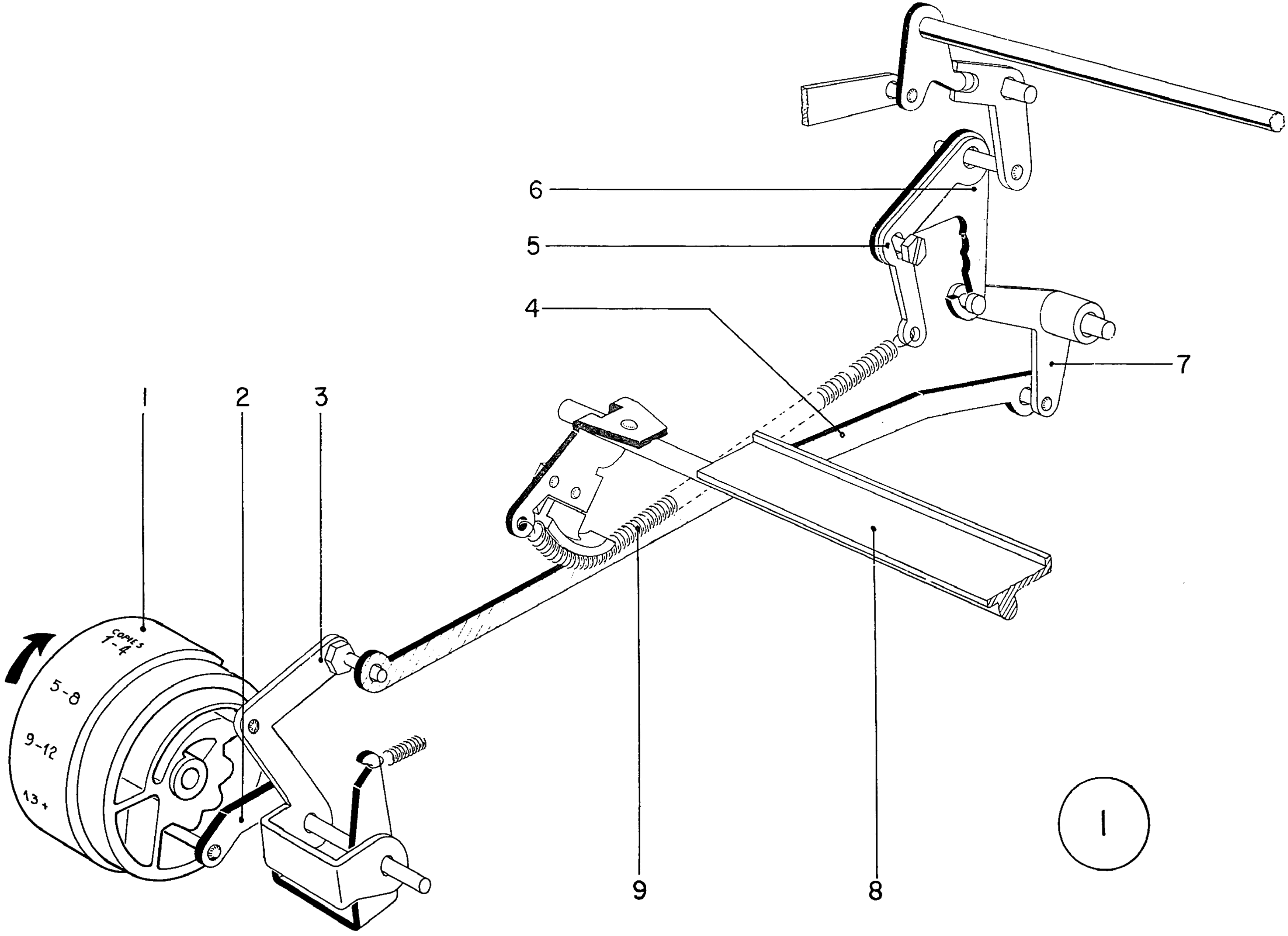
The detent crank (7) is connected, through the link (4), to the arm (3) which is controlled by the eccentric profile of the copies control dial (1). The dial is held securely in any one of its four positions by the detent bridge (2).

The figure illustrates the copies control dial set in the 1 - 4 copy position. The locating pin of the detent crank (7) is, consequently, in the bottom notch of the impression control arm (6).

ACTIVATION

Rotating the copies control dial (1) in the direction of the arrow causes the link (4) to move forward.

The locating pin of the crank (7) moves into a higher notch of the impression control arm (6) in accordance with the position of the dial 1. Therefore, the rotation of the arm (6) will stretch the printing spring (9), increasing the typing impact.



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SECTION 8

RIBBON LIFT - RIBBON FEED AND REVERSE

RIBBON LIFT AND SELECTION

The impression of a character on the paper is obtained by interposing a ribbon between the type slug and the paper at the time of impact.

For the operator to read what is being typed, the ribbon is raised only during the printing cycle. To enable typing in either of two colors, two different degrees of ribbon lift are provided. They are:

- Partial for typing in black
- Full for typing in red

For stencil work, the ribbon is prevented from raising.

The ribbon mechanism must provide for:

- Ribbon selection
- Ribbon lift

RIBBON SELECTION

The ribbon selector lever (10) may be set in any one of the three following positions: black, stencil, or red. The sector (8) has three corresponding steps, B, S and R.

Figure 3 shows the ribbon selector lever (10) set in the black position. In this position, the upper step (B) of the sector (8) is in front of the rubber bumper (A) of the control arm (7), as shown in figure 1.

When the ribbon selector lever is set in the stencil position, the extension S of the sector will be in front of the bumper (A). Likewise, when the selector lever is set in the red position, step R will be in front of the bumper.

The sector (8) and the ribbon selector lever (10) are held securely in each one of the three positions by the detent lever (9).

RIBBON LIFT

Ribbon lift is the movement required to raise the ribbon to a predetermined position through the action of the appropriate profile of the print cam group.

ASSEMBLY (REST POSITION)

The rest position of the ribbon guide (6) is determined by the parts (5), (4), (3), (2) and ribbon lift profile (1).

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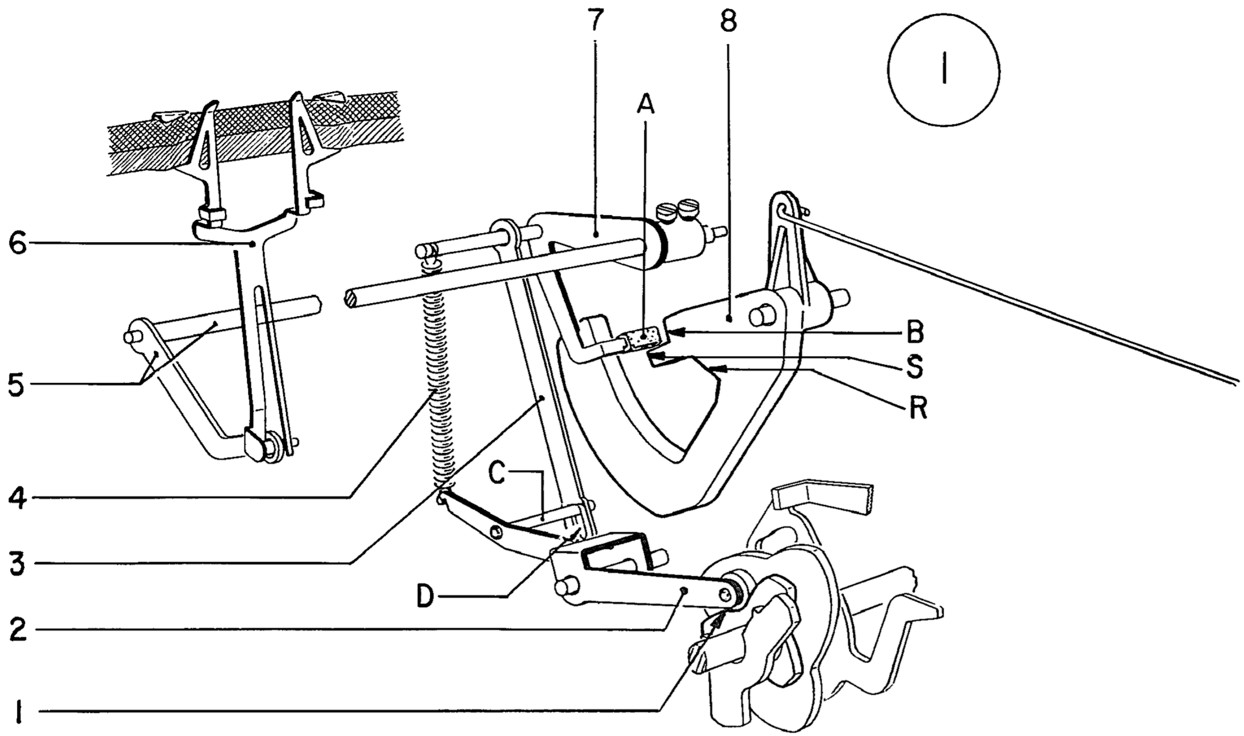

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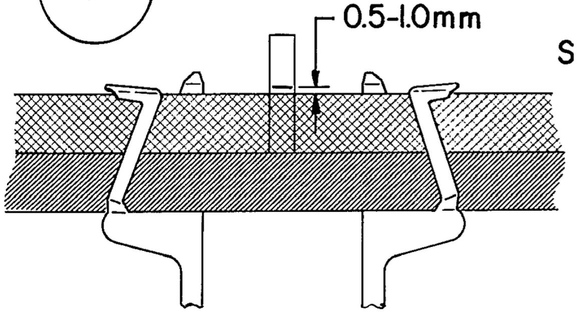

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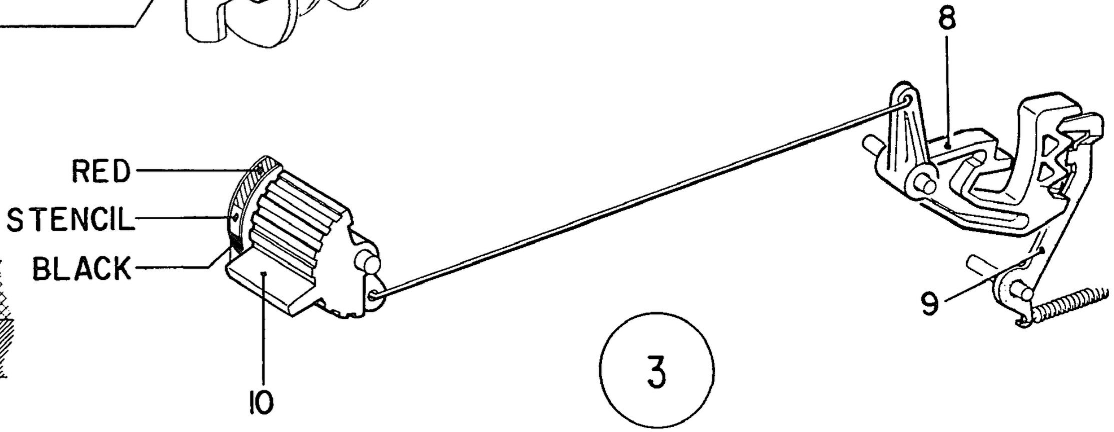


ACTIVATION

During each printing cycle, the profile of the cam (1) rotates the ribbon lift crank (2) the same amount, but the amount of rotation of the control arm (7) is determined by the steps of the sector (8). When the crank (2) is rotated by the cam profile, the spring (4) causes the control arm to rotate. When the rubber bumper (A) of the control arm limits against a step on the sector, the spring (4) yields, and the pin (C) assumes a floating condition in the slot (D) of the link (3). This movement raises the ribbon guide (6) to the preset position.

RESTORATION

As the cam profile returns to rest, the crank (2) rotates in a clockwise direction through the tension of the spring (4). Through this action the pin (C) raises the link (3), which, in turn, restores and maintains the ribbon guide at rest position.

ADJUSTMENT

Ribbon Guide Height Adjustment.

All type must strike within the black or red portions of the ribbon to prevent:

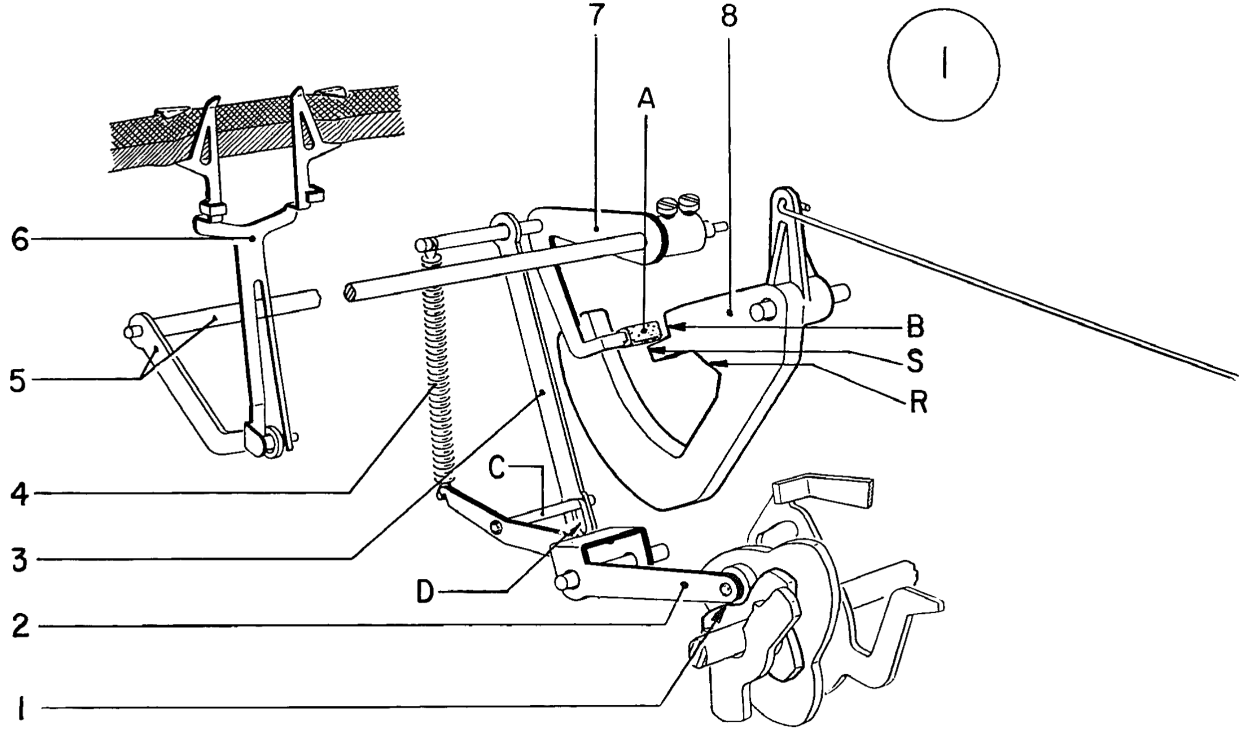
- Partial printing of the characters
- Mixing of the colors

Since the height of the segment has an effect on the portion of the ribbon where the type will strike, it is necessary that the "type-on-feet" and "motion" adjustments be correct before performing the ribbon height adjustment. (Refer to Section 14, Printing Adjustments.)

Check the ribbon guide height, as follows:

With the segment in upper case position and the print cam group at rest, raise the underscore type bar to the printing point by hand. In this position the underscore type face must clear the top of the ribbon between 0.5 to 1.0 mm, as illustrated in figure 2.

To adjust the height, loosen the two screws on the control arm (7) and manually raise or lower the ribbon guide (6) as required. Tighten the screws.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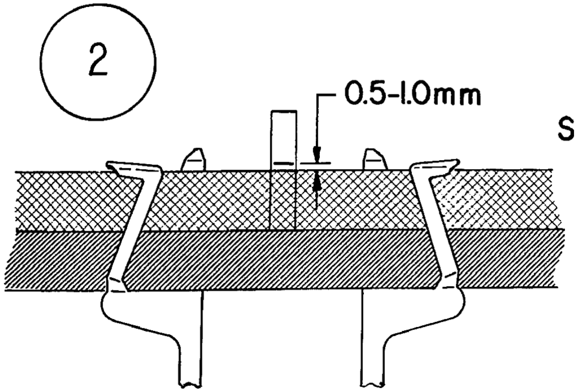
7
8
A
B
S
R
6
5
4
C
3
D
2
1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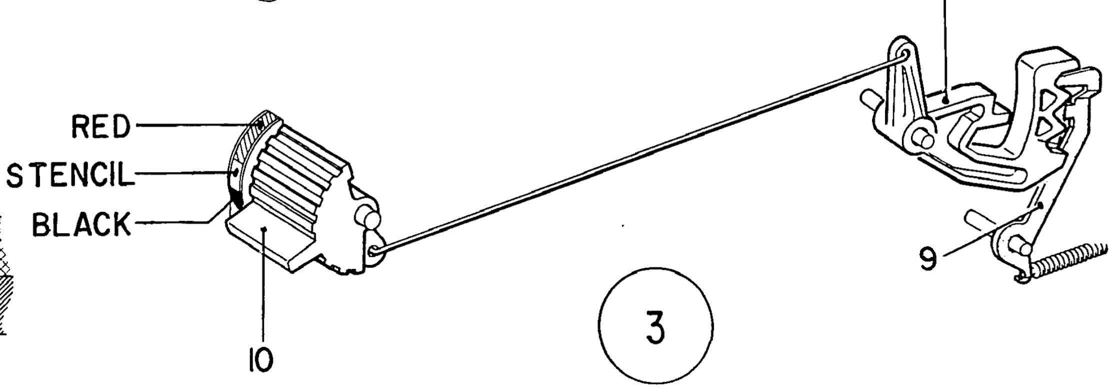
0.5-1.0mm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8
RED
STENCIL
BLACK
9
10

RIBBON FEED AND REVERSE

To attain uniform density of the printed characters, the ribbon advances or feeds on each keystroke operation. Through this movement, a fresh portion of the ribbon is placed in front of the next character to print. Since the ribbon is wound on two spools and is limited in length, it must be able to reverse its direction of travel.

ASSEMBLY (REST POSITION)

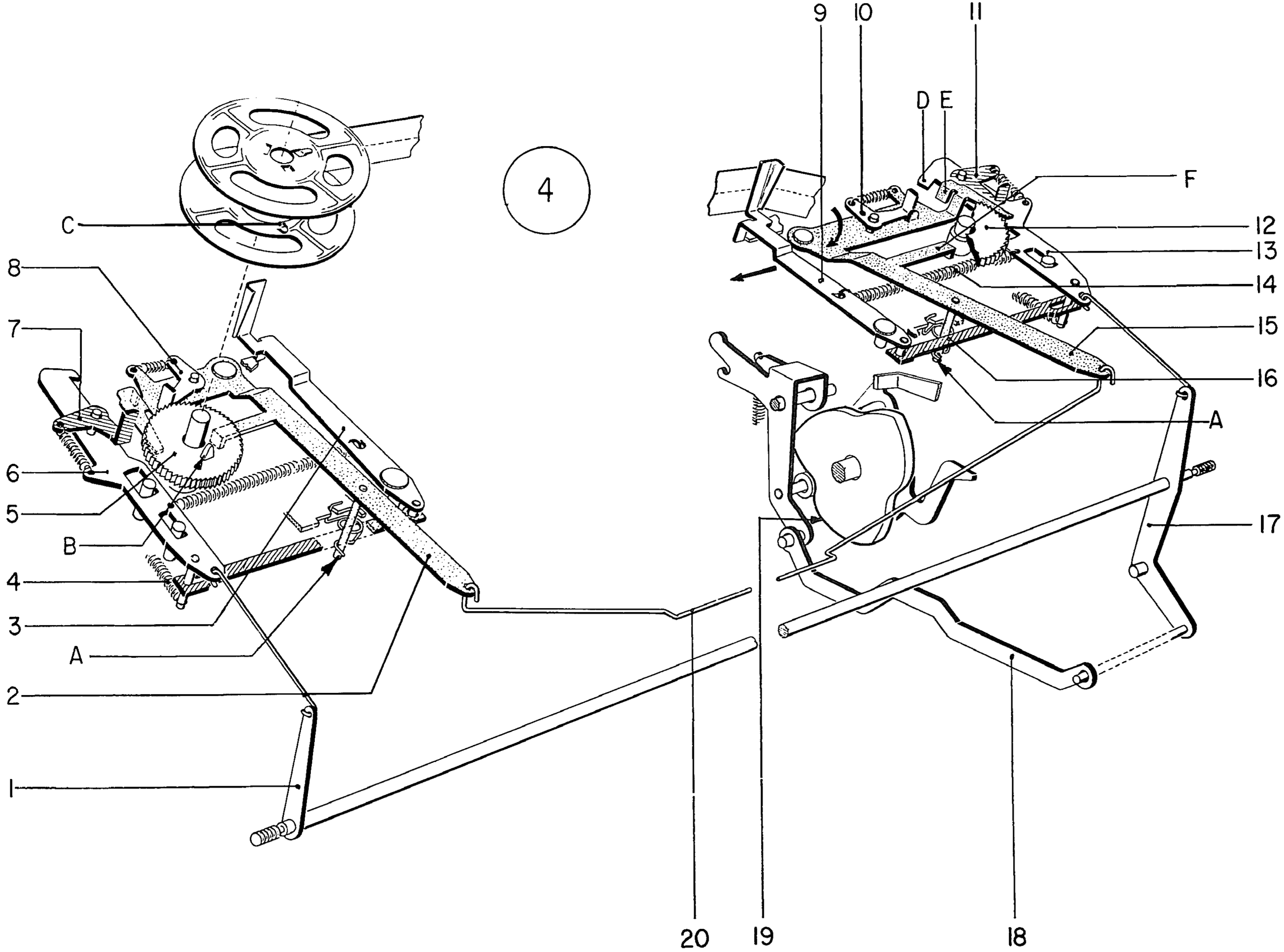
The ribbon spools are mounted on the ribbon spool ratchets (5 and 12), and are controlled in the following manner:

- The ribbon spools are coupled to their respective ratchets by the projection (B) of the ratchet locating in the slot (C) of the ribbon spool.

- During the feeding of the ribbon, only one of the two spools is driven while the other spool unwinds. A slight braking action is applied to the ribbon spool which is unwinding to eliminate slack in the ribbon. Figure 4 indicates that the left-hand ribbon spool mechanism is in the position to feed the ribbon. Therefore, the braking action is applied to the ratchet (12) through the extension shoe (F) of the reverse crank (15) riding on the hub of the ratchet. The pressure of the shoe against the hub is rendered by the two toggle springs on pins (A).

- The left and right ribbon reverse cranks (2 and 15) are coupled together by the wire link (20). With the extension shoe (F) of the right reverse crank limiting against the hub of the ratchet (12), the left reverse crank allows the check pawl (8) to engage with the ratchet (5) and the feed pawl (7) to preset to engage the ratchet. Conversely, the right reverse crank (15) holds the check pawl (10) and feed pawl (11) disengaged from the ratchet (12). As a consequence, the left ribbon spool assembly is in position to feed the ribbon while the right ribbon spool is set to unwind.

- The ribbon feed pawls (7 and 11) are assembled to their respective actuating slides (6 and 13). Both actuating slides are coupled to the ribbon feed frame through the arms (1 and 17). The ribbon feed frame is controlled through the connecting link (18), by the escapement trip profile (19) of the print cam.


C
B
A
D
E
F
A

RIBBON FEED ACTIVATION

During every printing cycle the escapement trip profile (19) causes the connecting link (18) to move rearward. This action rotates the ribbon feed frame arms (1 and 17), which pull both actuating slides (6 and 13) forward. The left feed pawl (7) engages with the ratchet (5) and advances it two teeth. The right feed pawl (11), being out of the path of the ratchet (12), performs a void travel.

Near the completion of the printing cycle, the cam profile allows the connecting link (18), the feed frame, and both actuating slides (6 and 13) to restore. The check pawl (8) prevents the ratchet (5) from rotating backward as the feed pawl (7) returns to rest.

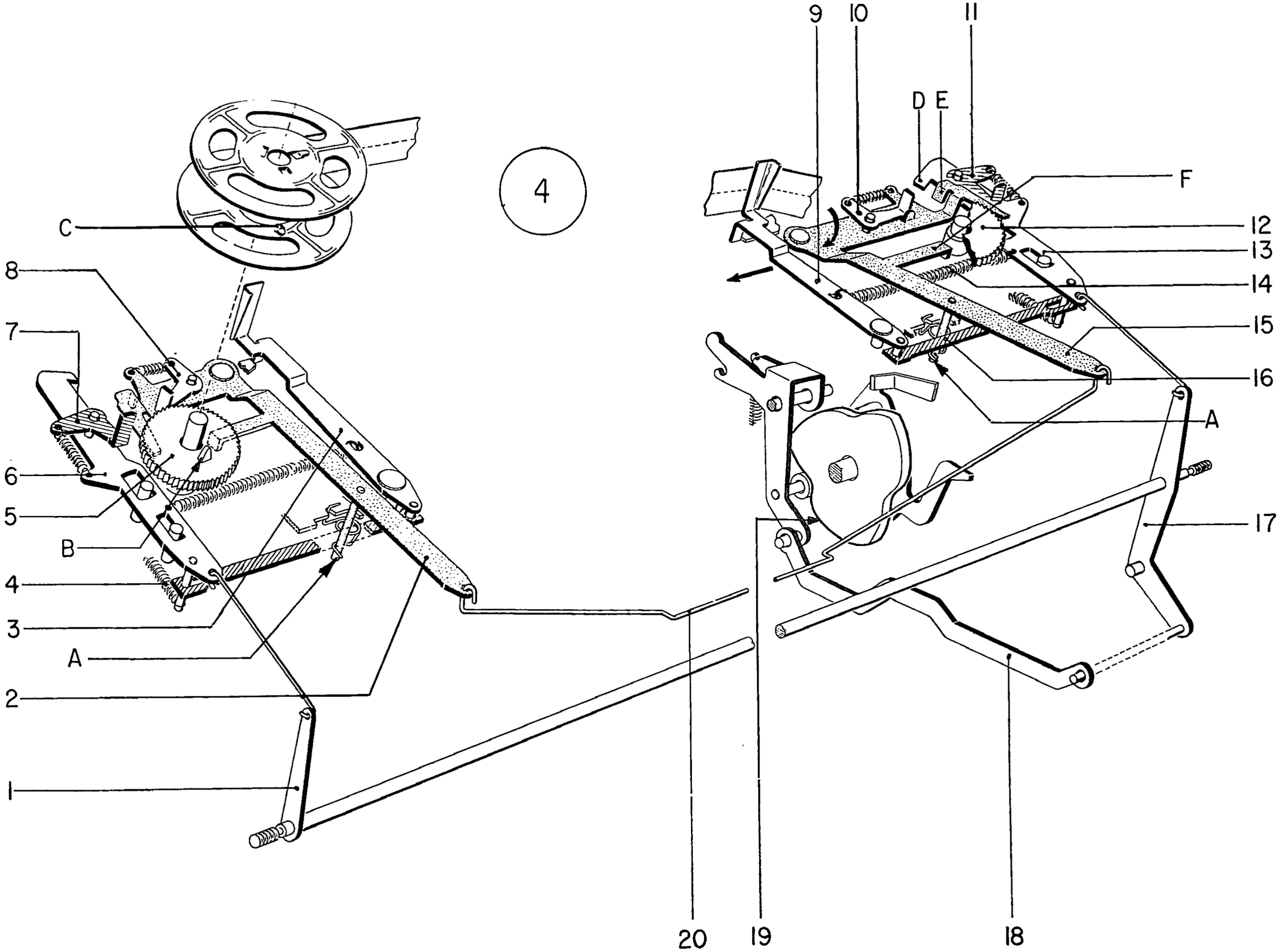
RIBBON REVERSE MECHANISM

Presetting.

When the ribbon becomes slightly taut as it approaches the end of its travel, the reverse arm (9) rotates in the direction of the arrow. This movement, through the combined action of link (16) and spring (14), causes the actuating slide (13) to rotate, thus placing its hook (D) in the path of the wing (E) of the reverse crank (15).

Activation.

The next printing cycle following the presetting action causes the actuating slide (13) to move forward. The hook (D) of the actuating slide contacts the wing (E) and rotates the reverse crank (15) in the direction of the arrow. This movement, through the connecting link (20), also rotates the reverse crank (2). The extension shoe of the crank limits against the hub of the left ribbon spool ratchet (5) under the tension of the toggle spring on the pin (A). The pawls (10 and 11) are now in a working position while the pawls (7 and 8) are inoperative. The reversing action is completed and the ribbon will now feed on the right-hand spool.


D
E
F
A
C
B
A

Ribbon Feed and Reverse Adjustment.

The following check and adjustment ensures both proper ribbon feed and reversing action.

- Depress a character key lever.
- While slowly rotating the power shaft, check that the feed pawl advances the ribbon spool ratchet two teeth in respect to the check pawl.
- When the cam (5) rotates the ribbon feed frame (6) to its maximum position, a minimum clearance of 0.1 mm should exist between the stud (4) and the rear of the slot in the activating slide (3).
- Perform a similar check for the opposite side of the mechanism.
- Check that all moving parts of the ribbon feed and reverse mechanism have complete freedom of movement.
- Adjust for both the ribbon spool ratchet advance and the clearance conditions required above by positioning the ribbon spool bracket (2) as required.

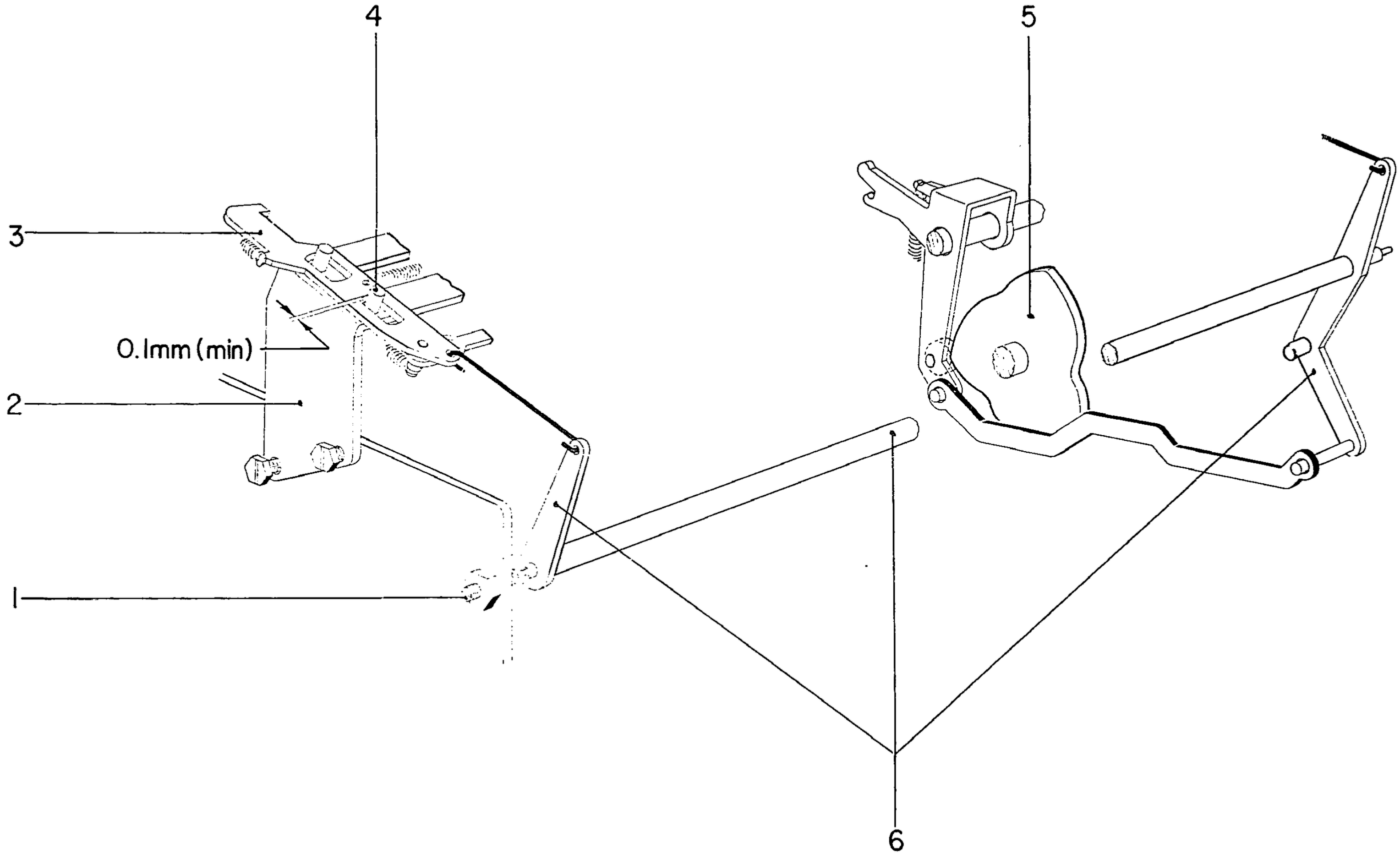
Note. The same adjustment applies to the right ribbon spool bracket.

Ribbon Feed Frame Adjustment.

The ribbon feed frame (6) must be free to move with a minimum amount of end play.

To adjust, regulate the pivot set screw (1) and lock nut, as required.

(5)



SECTION 9

CARRIAGE FIXED RAIL ASSEMBLY AND FRAME

INTRODUCTION TO CARRIAGE FIXED RAIL ASSEMBLY AND FRAME

The carriage supports the platen and correctly positions the paper in respect to the type bars. To function properly, the carriage must travel freely and without play between the guide rails.

CARRIAGE FIXED RAIL ASSEMBLY

There are two guide rails (1 and 3) with a V-groove through their entire length.

- The front guide rail (3) is mounted to the carriage fixed rail support (4), and is adjusted at the factory by means of a special gauge.

- The rear guide rail (1) is attached to the carriage fixed rail support (4) by the screws (6). Its adjusted position is secured by the screws (5).

CARRIAGE FRAME

The carriage frame (2) is comprised of the following:

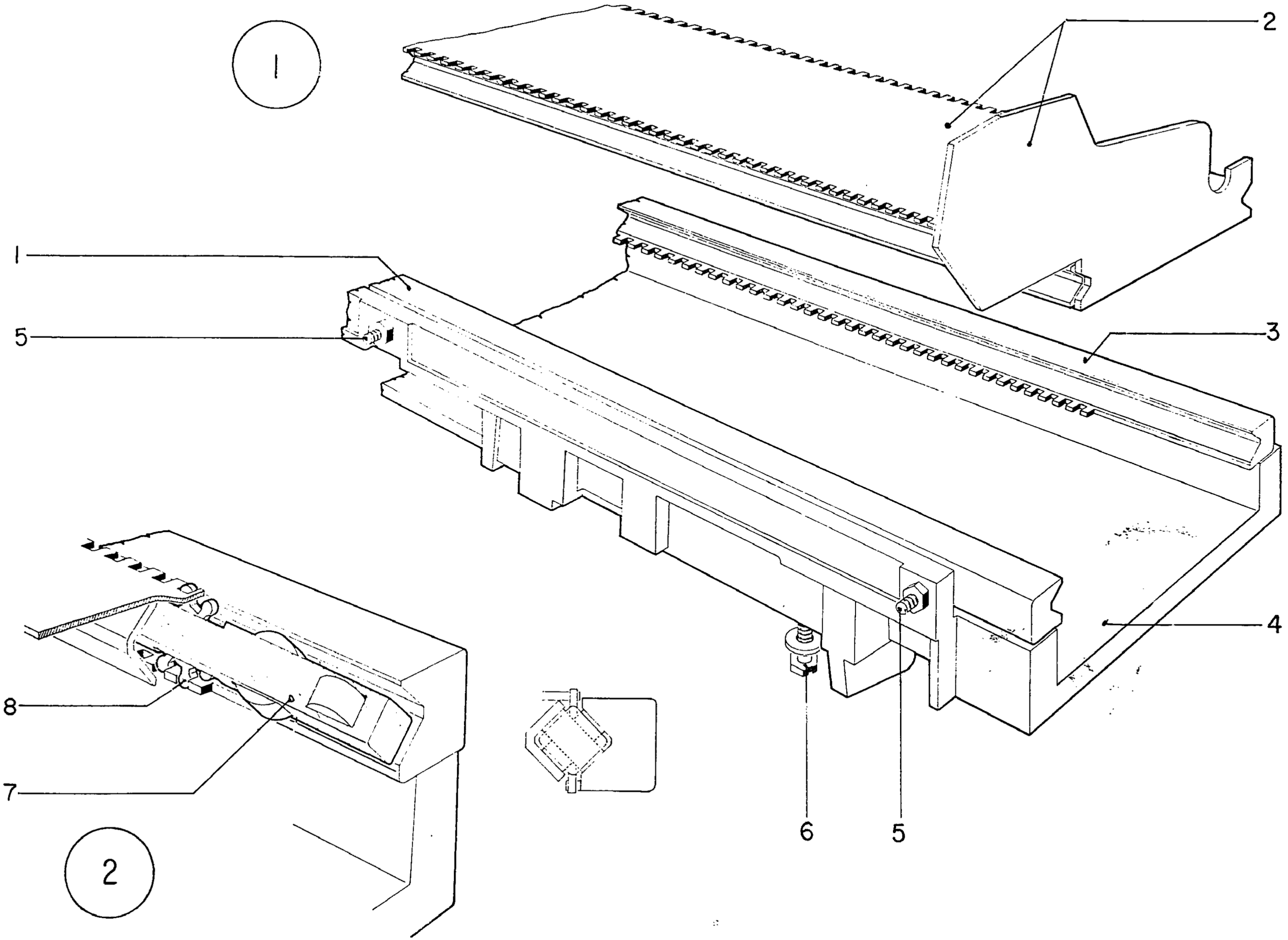
- Two side plates
- The connecting frame with V-rails

CARRIAGE ROLL RETAINERS

The carriage travels on roller bearings which are assembled in the carriage roll retainer (1), figure 2.

Two carriage roll retainers are located between the V-grooves of the rear guide rail (1) and the carriage frame (2). Two additional carriage roll retainers are positioned between the V-grooves of the front guide rail (3) and the carriage frame.

The pinion gear (8) of each carriage roll retainer (7) is meshed with the rack on the carriage frame and a corresponding rack of the guide rail, as shown in the figure 2. These racks govern the movement of the carriage bearings through the entire travel of the carriage.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CARRIAGE FIXED RAIL SUPPORT

During assembly of the machine at the factory, the carriage fixed rail support (3) is adjusted in relation to the two side plates (1) of the machine by use of special gauges, and under normal conditions should not be disturbed.

ADJUSTMENT

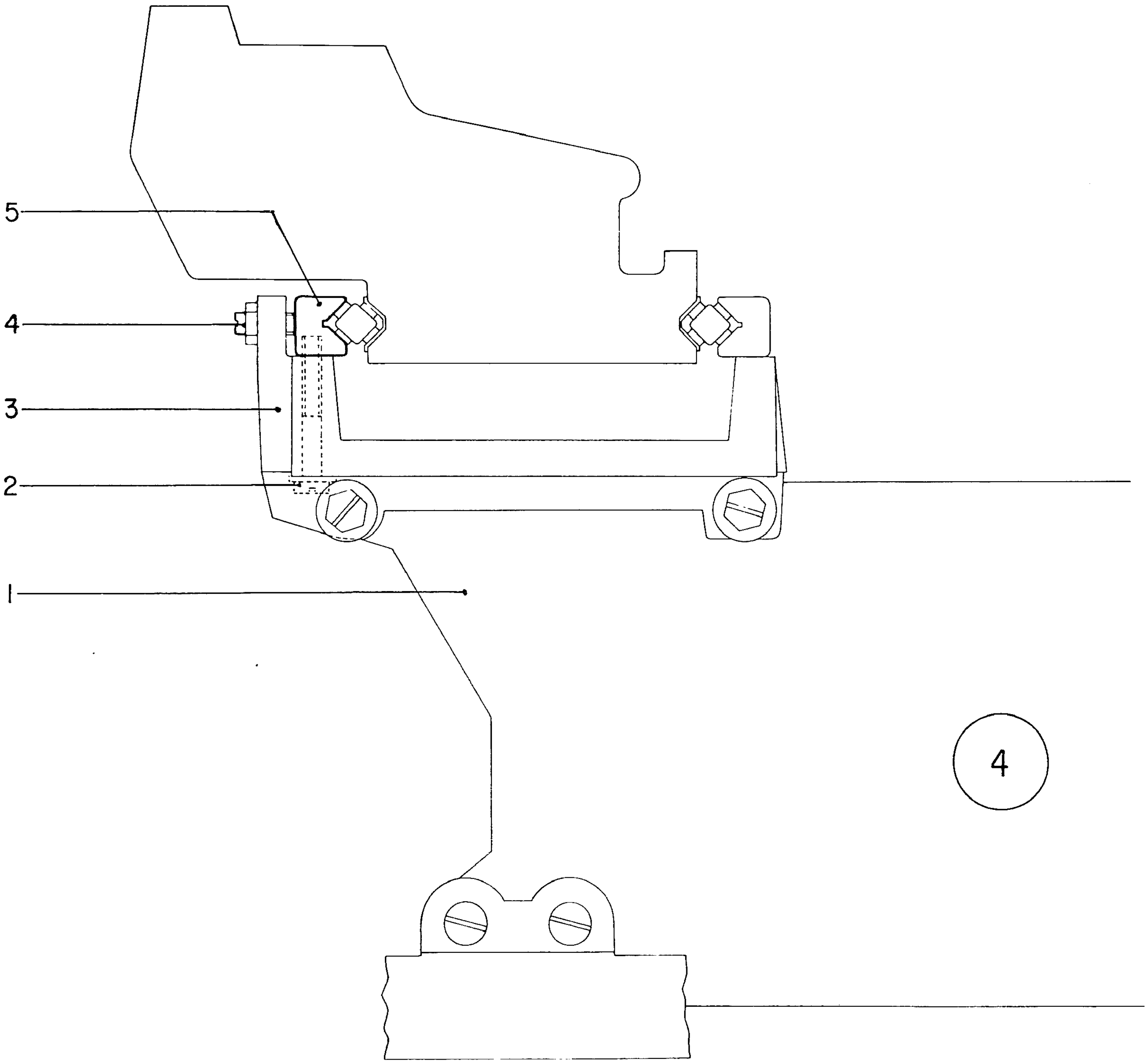
CARRIAGE REAR GUIDE RAIL ADJUSTMENT

The carriage must move freely throughout its entire travel with an absolute minimum of play.

To adjust:

- Disconnect the carriage return and main spring drawbands from the carriage.

- Reposition the rear adjustable rail (5) by adjusting the screws (2 and 4) until the required condition is obtained.



SECTION 10

ESCAPEMENT

INTRODUCTION TO ESCAPEMENT

To obtain the correct spacing of characters when typing, the carriage must move a predetermined distance for each depression of a character key. The carriage movement is controlled by:

- The escapement rack, which provides the individual spacing positions.
- The escapement dog, which holds the carriage at rest.
- The carriage main spring drum assembly which furnishes the force to move the carriage to the left.

CARRIAGE (REST POSITION)

- The escapement rack (3) is made in one piece and is secured to the carriage frame with resilient mounting blocks. The distance between two successive teeth of the rack is the same as the distance between two characters. This distance is defined as the "pitch" of the machine.
- The rest position of the carriage is established by the escapement dog (5). The carriage main spring holds the carriage under tension and supplies the necessary force to move the carriage to the left.

CARRIAGE DRAW BAND

The transference of energy from the main spring to the carriage is provided by the steel draw band (6). One end of the draw band is attached to the bracket (4) of the carriage, and the opposite end to the hook (B) of the main spring drum.

CARRIAGE MAIN SPRING DRUM ASSEMBLY

The carriage main spring drum assembly consists of the following parts:

- The main spring drum with centrifugal brake gear (1) which rides free on the spindle (D).
- The outer cover (2) which is keyed to the spindle (D).
- The main spring (7) with its inner loop attached to the hook (A) of the drum, and outer loop to the hook (C) of the cover.

ADJUSTMENTS

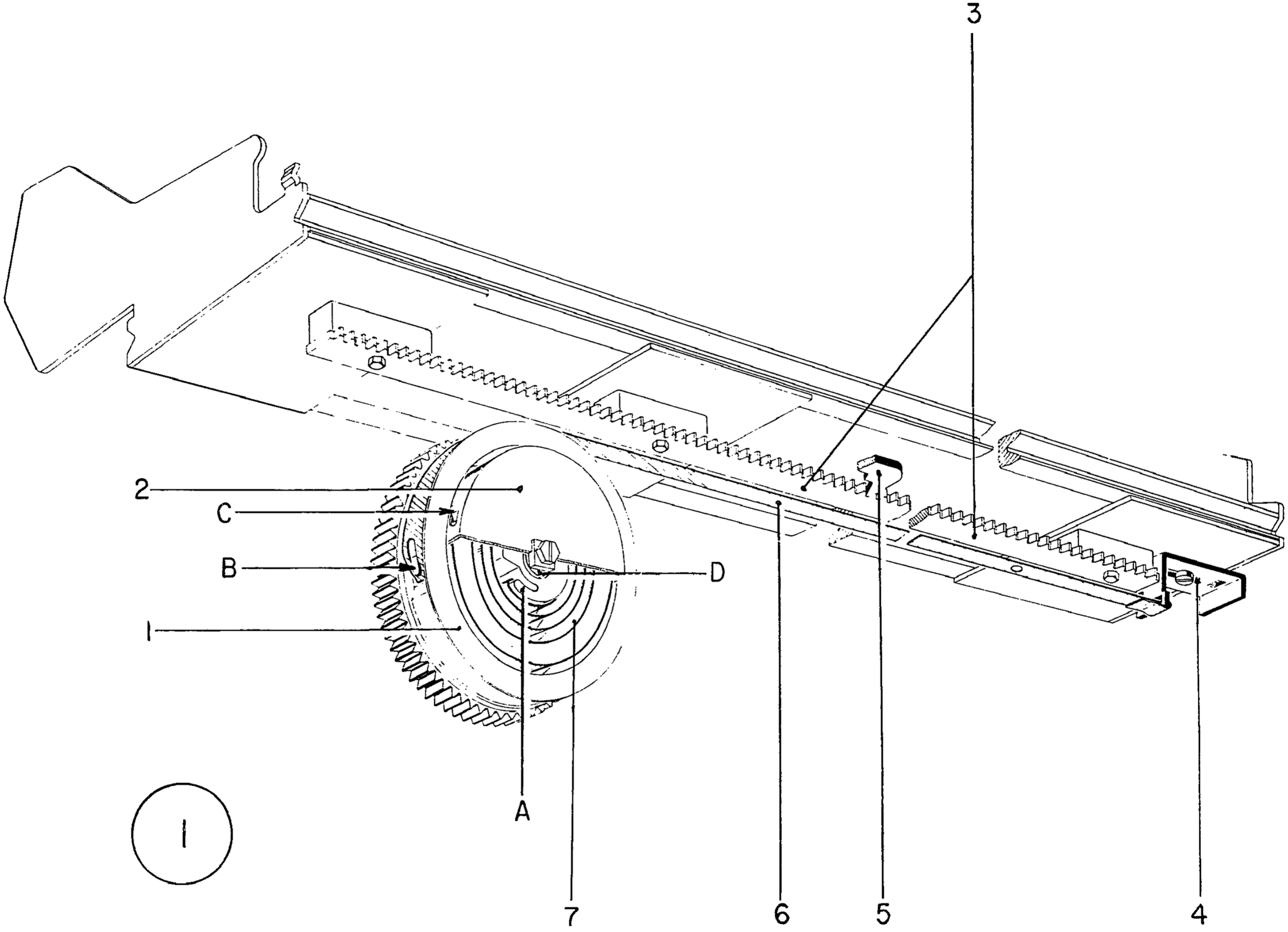
CARRIAGE MAIN SPRING TENSION

The carriage main spring tension must be sufficient to firmly move the carriage to the extreme end of its travel while typing, and to positively actuate the line lock mechanism.

To adjust, carefully unhook the carriage draw band from the main spring drum. Turn the main spring drum clockwise to increase the tension and counterclockwise to decrease the tension. (Refer to the main spring tension values below.) Rehook the carriage draw band.

> Note. Excessive main spring tension may hinder operation of the backspace mechanism.

Carriage length	Carriage at 1st position on carriage position scale	Carriage at last position on carriage position scale
13" and 18"	1800 grams (63.5 oz.)	1000 grams (35.3 oz.)
21" and 27"	2200 grams (77.6 oz.)	900 grams (31.7 oz.)



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ESCAPEMENT MECHANISM

The escapement is the device which controls movement of the carriage. To obtain correct spacing of the carriage in relation to the printing point, it is necessary to:

- Disengage the escapement dog from the escapement rack to allow the carriage to move to the left under the action of the main spring.
- Re-engage the escapement dog with the next tooth of the escapement rack to prevent the carriage from moving more than one space at a time.

The escapement action is controlled through the profile (11) of the print cam group.

ASSEMBLY (REST POSITION)

The escapement assembly consists of the following parts:

- The escapement dog advance crank adjusting plate (14) which is secured to the carriage fixed rail support by the shoulder screws (3 and 6).
- The escapement trip lever (10) which is under the control of the escapement trip profile (11) of the print cam.
- The escapement trip intermediate bridge (9) which is integral with the escapement trip shaft (8) through spring (13).
- The escapement trip shaft arm (B) which rests against the extension (C) of the adjusting plate (14) through tension of the spring (12).
- The escapement dog release lever (5) which pivots on the shoulder screw (3) and rests against the arm (B) under tension of the spring (4).
- The escapement dog advance crank (16) which rests against the stop (A) of the adjusting plate (14) and is locked by the latch (7). The advance crank (16) is under tension of the spring (17).
- The escapement dog (1) pivots on the crank (16), and is engaged in the rack (2) under tension of the spring (15).

ACTIVATION

During a printing cycle, the escapement trip profile (11) activates the parts (10), (9) and (8), rotating the arm (B) in the direction of the arrow. Through this action the arm (B) rotates both the escapement dog release lever (5) and the latch (7). This causes the escapement dog (1) to disengage from the rack and immediately advance to re-engage with the next tooth of the rack. The carriage can therefore move to the left, one space at a time, under tension of the carriage main spring.

The following page shows the various movements of the escapement mechanism during a printing or spacing cycle.

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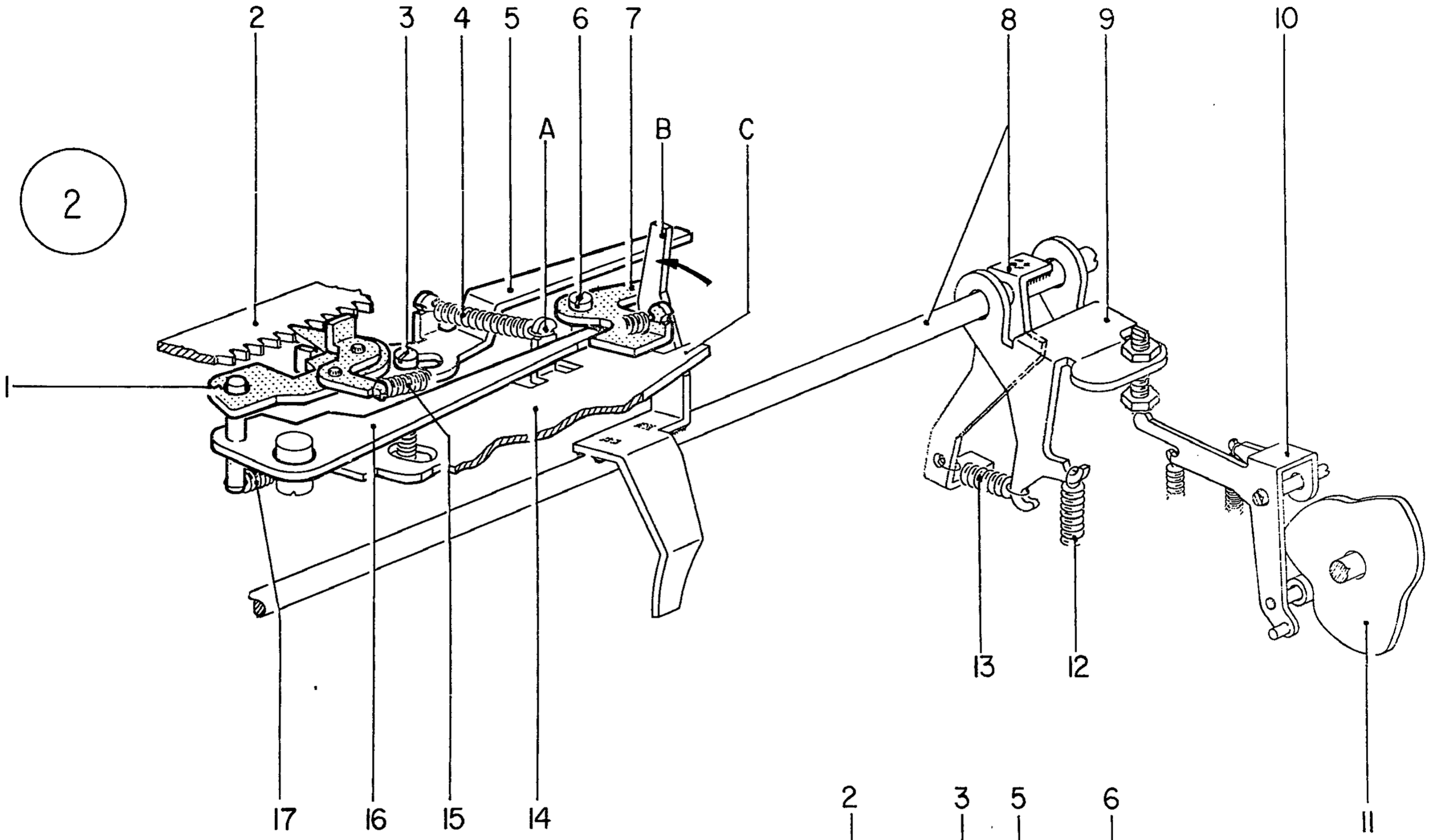

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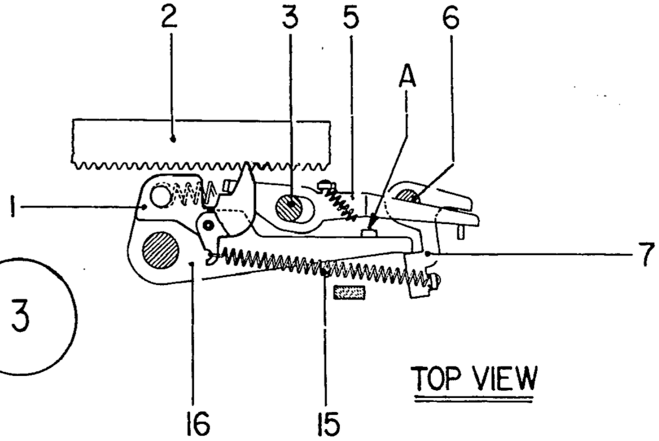


TOP VIEW

Figure 4 shows the escapement unit at rest.

- The escapement dog (1) is engaged in the rack (2) and is holding the carriage at rest.
- The main spring is applying tension to the carriage in the direction indicated by the arrow.
- The escapement dog advance crank (16) is at rest against the stop (A), and is locked in position by the latch (7).
- The escapement dog release lever (5) is at rest against the arm (B).

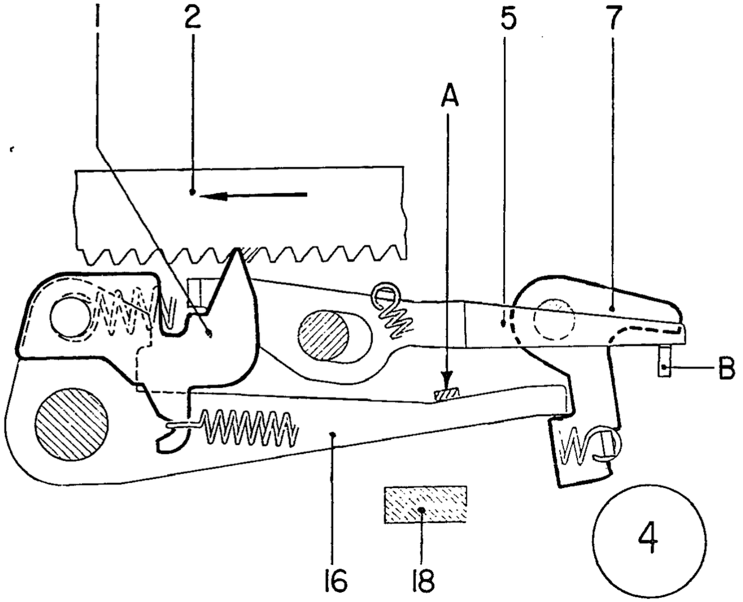
Figure 5 shows the escapement during a printing cycle. The arm (B), in moving rearward, has rotated both the release lever (5) and the latch (7). At the moment the latch disengages the advance crank (16), the escapement dog (1), under the control of the release lever (5), is still partially engaged with the shaded tooth of the rack.

Figure 6 indicates that the arm (B) has moved fully rearward, causing further rotation of the release lever (5), thereby releasing the dog (1) from the rack. When the dog disengaged from the rack, the advance crank (16), activated by the spring (17), quickly rotated and limited against the rubber stop (18). The rotation of the advance crank caused the dog to advance rightward. Through this movement, the step (C) on the dog lost contact with the wing (E) of the release lever and the dog, under spring tension, immediately re-entered the rack in preparation to engage the next tooth. At this precise moment, the carriage has not yet started to move leftward.

Figure 7 indicates that the carriage has moved toward the left, since the inertia of the carriage has been overcome by the main spring tension. The leftward movement of the carriage forced the dog to the left and caused the advance crank (16) to restore against the stop (A). During this time the arm (B), under the control of the escapement trip cam, is restoring to rest position, permitting:

- The latch (7) to re-engage the crank (16).
- The restoring of the release lever (5).
- During the leftward movement of the carriage, the release lever was momentarily pulled to the left by the escapement dog. As the arm (B) restores, the wing (E) rides up on the inclined surface (D), allowing the release lever (5) to fully restore.

The escapement unit will again assume the position shown in figure 4 with the carriage moved by one space. It should be noted that the advance crank restores gently against the stop (A), since the spring (17) acts as a shock-absorber which cushions the stopping of the carriage and also prevents rebounding.



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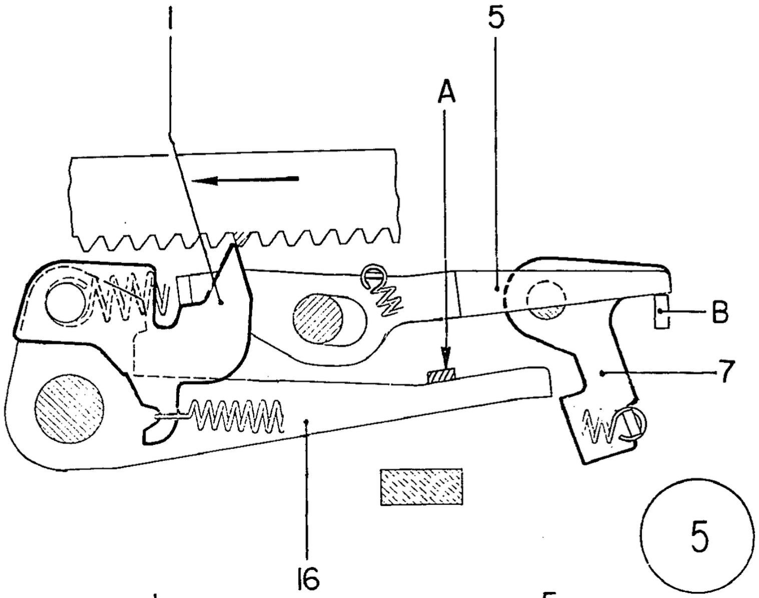

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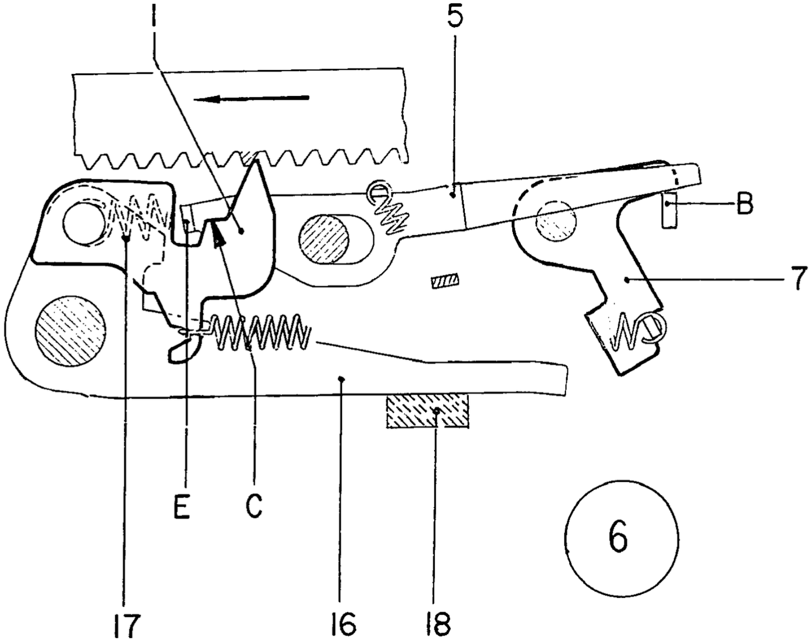

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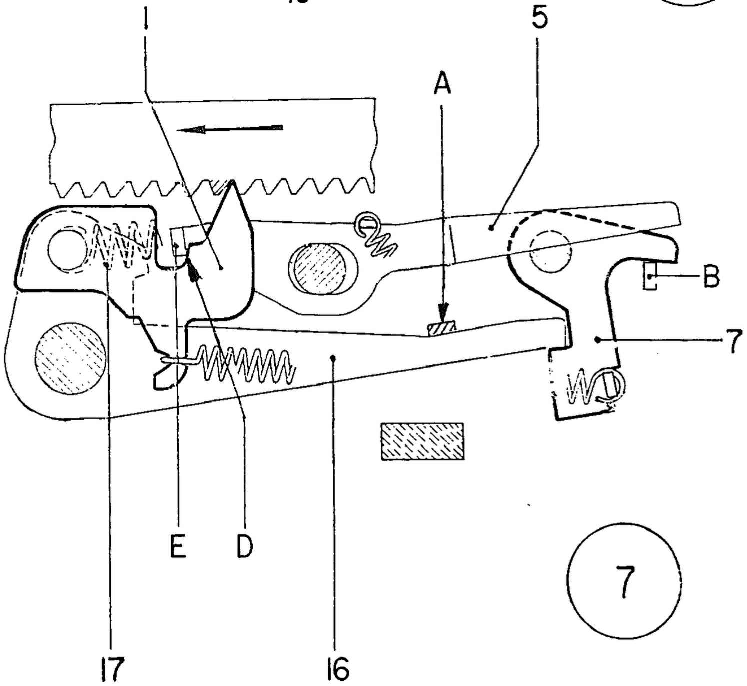

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Escapement Rack Adjustment.

The escapement rack is attached to the carriage by resilient mounting blocks. The position of the escapement rack in respect to the carriage frame has been factory-adjusted with special gauges.

Should it become necessary to replace or readjust the escapement rack, refer to Section 29 (Positions of Escapement Rack, Margin Stop Rack, and Tabulator Stop Rack).

Escapement Dog Advance Crank, Rest Position Adjustment (Figure 8).

To prevent the advance crank (16) and, in turn, the carriage from rebounding during typing, the latch (7) must lock the advance crank firmly against the stop (A) at rest position.

To adjust:

- Loosen the shoulder screws (3 and 6).
- Move the adjusting plate (14) back or forth until the latch (7) maintains an engagement of 0.8 to 1.5 mm on the advance crank (16, figure 9).
- Tighten the two shoulder screws.
- Check that the advance crank has no play between the stop (A) and the latch (7).

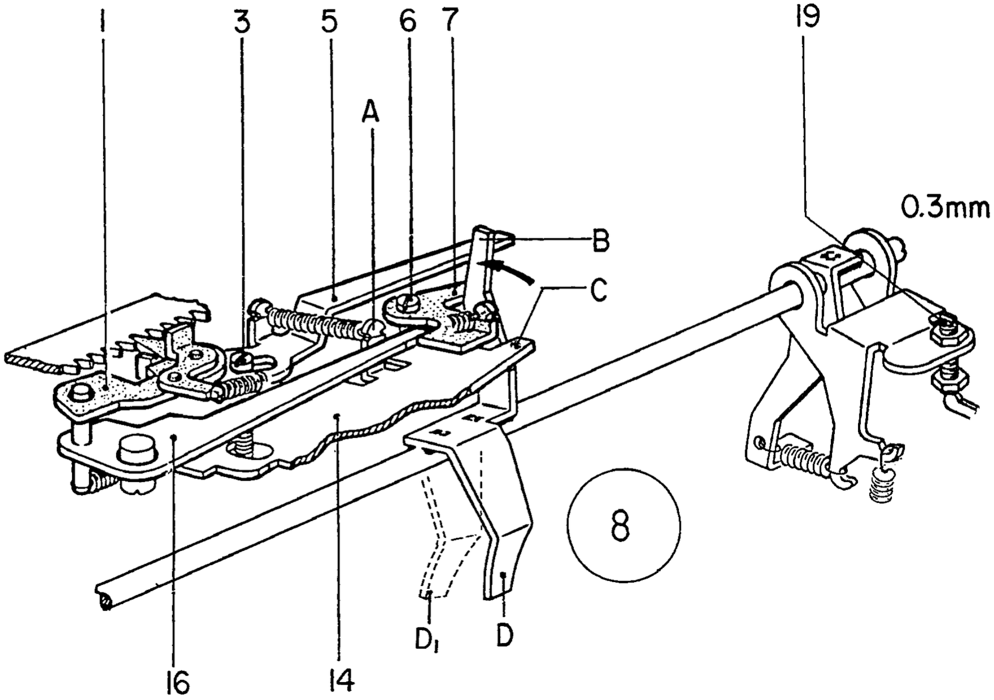
Escapement Dog Advance Crank, Release Adjustment.

To ensure that the escapement dog can re-engage the next tooth of the rack without skipping, the latch (7) must release the advance crank (16) before the dog (1) disengages from the rack. Check for this condition as follows (refer to figure 10):

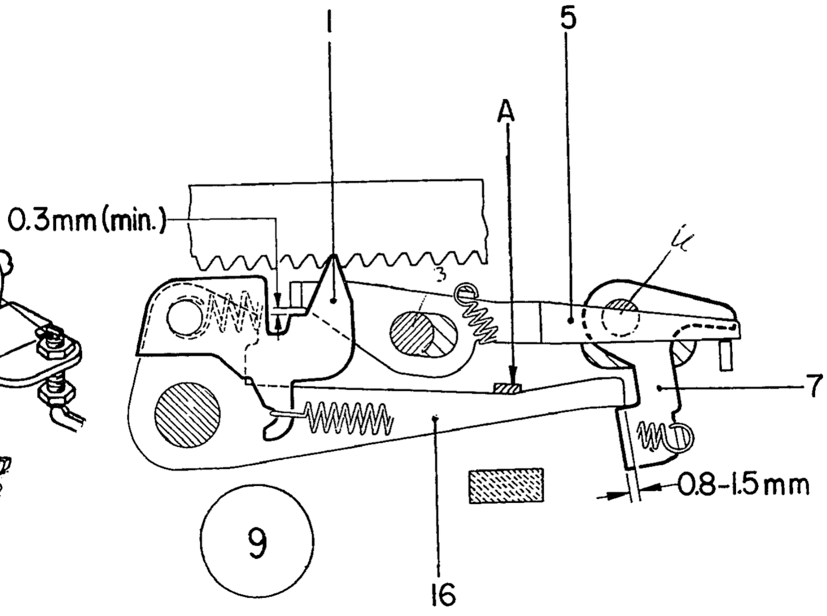
- Disconnect the power cord from the machine.
- Place the machine on its back.
- The escapement dog can be seen through the access hole in the carriage fixed rail casting located directly above the "service unit."
- Depress a character key and slowly rotate the power shaft.
- Stop the rotation when the dog (1) has an engagement of 0.2 to 0.5 mm on a tooth of the rack. At this point the latch (7) should release the advance crank (16) with a small clearance (E).
- Move the carriage slightly to the right so the pressure of the carriage is removed from the dog. Observe that the dog (1) follows the rack as it moves to the right. (This action indicates that the advance crank (16) was released by the latch (7). If the dog did not follow the carriage movement, the advance crank was not released and the adjustment procedure must be performed.)

To adjust for the proper release and clearance conditions indicated above, proceed as follows:

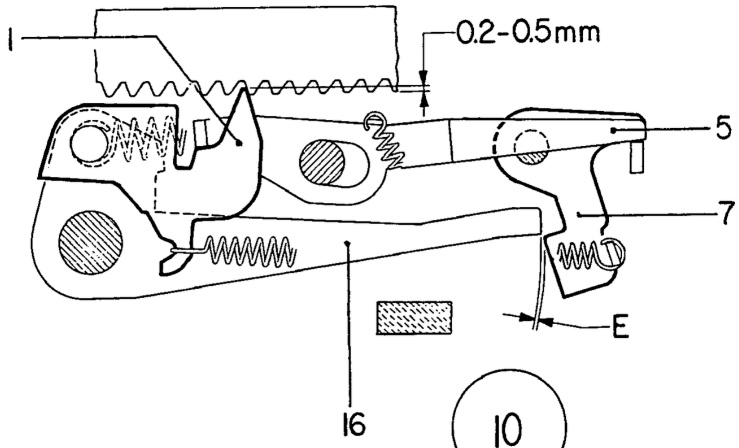
- Form the right end of the release lever (5) as required.


A
B
C
D1
D

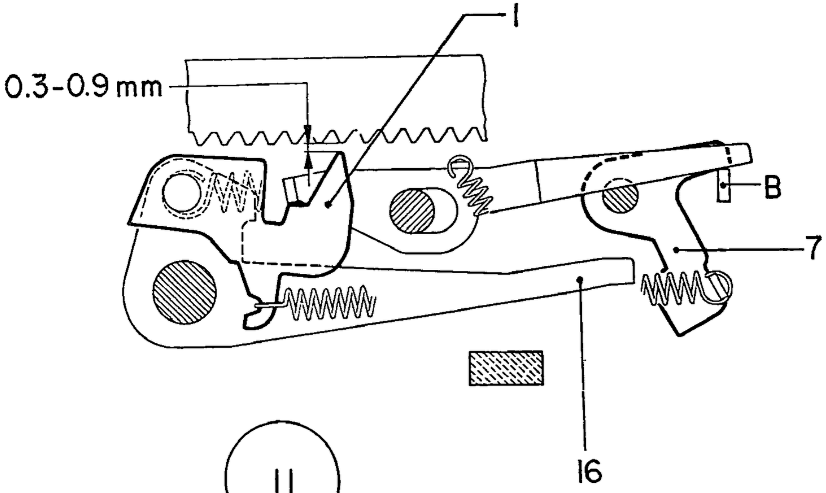
⑧


1
5
A
0.3mm (min.)
u
3
7
0.8-1.5mm
16

⑨


0.2-0.5mm
E

⑩


0.3-0.9mm
B

⑪

- Repeat the check on the previous page to verify the adjustment.
- Refer to figure 9. With the escapement at rest, check that a minimum clearance of 0.3 mm exists between the step of the dog (1) and the wing of the release lever (5). (This clearance should be established automatically, since the rest position of the release lever (5) is established by the arm (B) being at rest against the extension (C) of the adjusting plate (14), figure 8. If necessary, because the advance crank release adjustment and this clearance are interrelated, perform the adjustment procedure until all requirements are met.)

Escapement Dog Disengagement Adjustment.

After the type bar has printed, the escapement dog must release from the rack with a clearance of 0.3 to 0.9 mm to allow the carriage to space properly (figure 11).

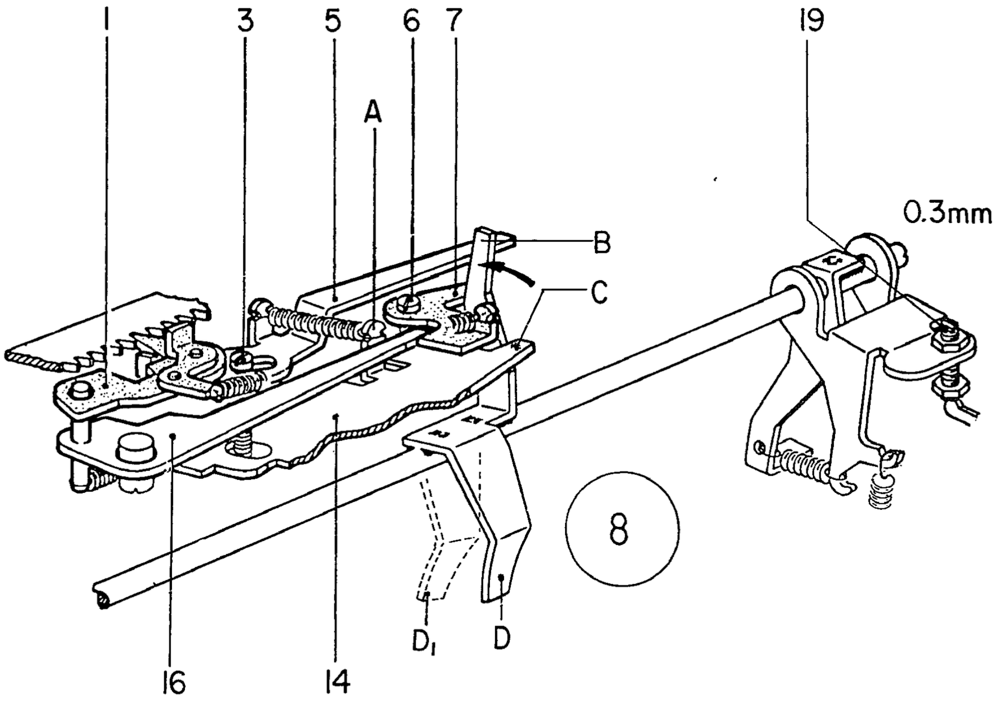
To check and adjust the release clearance of the dog, proceed as follows:

- Disconnect the power cord from the machine.
- Place the machine on its back.
- The escapement dog can be seen through the access hole in the carriage fixed rail casting located directly above the "service unit."
- To make it possible to observe the release clearance, the advance crank (16) must be prevented from rotating when the latch (7) releases the crank. This is accomplished by depressing the back-space key and a character key, simultaneously.

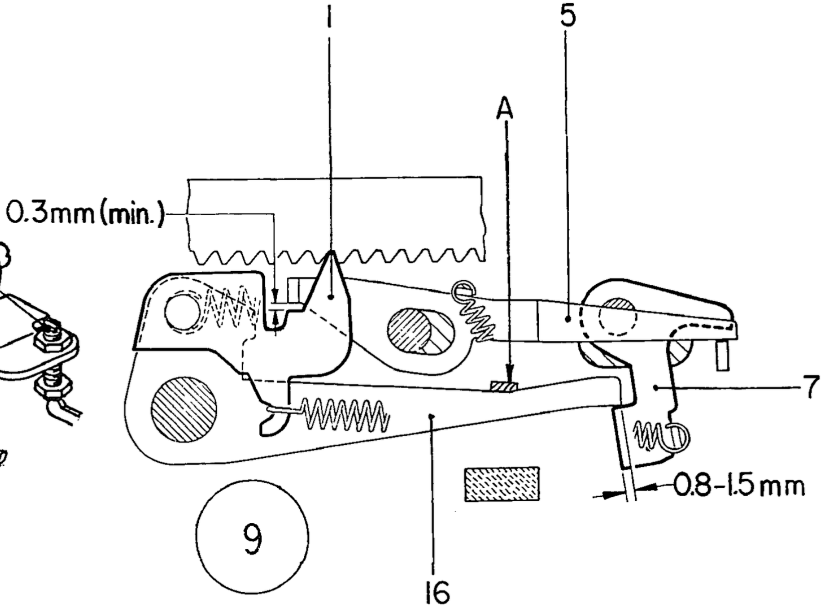
  ~~Note. Temporarily form the finger D to the position D1 of figure 8 so that it does not touch the finger of the reset frame shaft (not shown) during rotation. (This step is necessary since the "reverse underscoring" feature on the Editor 4 prevents the escapement trip from occurring during a back-space cycle~~.)

- Hold the carriage, and slowly turn the power shaft until the dog (1) reaches its maximum disengagement from the rack, which should be 0.3 to 0.9 mm (figure 11).
- To adjust, regulate the escapement trip adjusting screw (19, figure 8), as required.
- ~~Readjust the finger D. (Refer to the "escapement trip exclusion adjustment" in Section 20, page 228.~~)

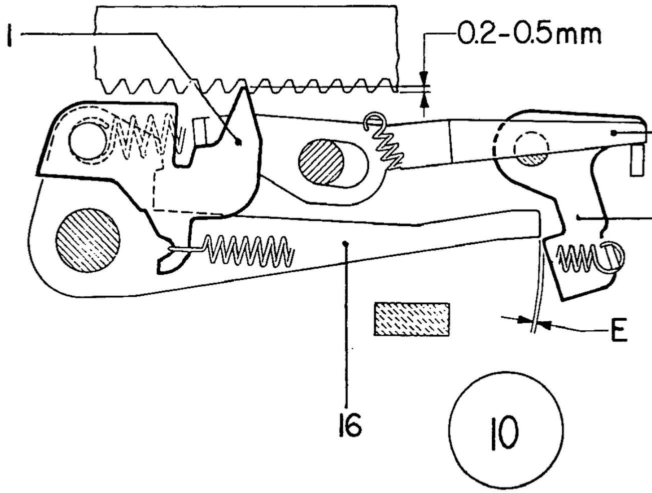
insert paper clip as in figure ⑪


A
B
C
D₁
D

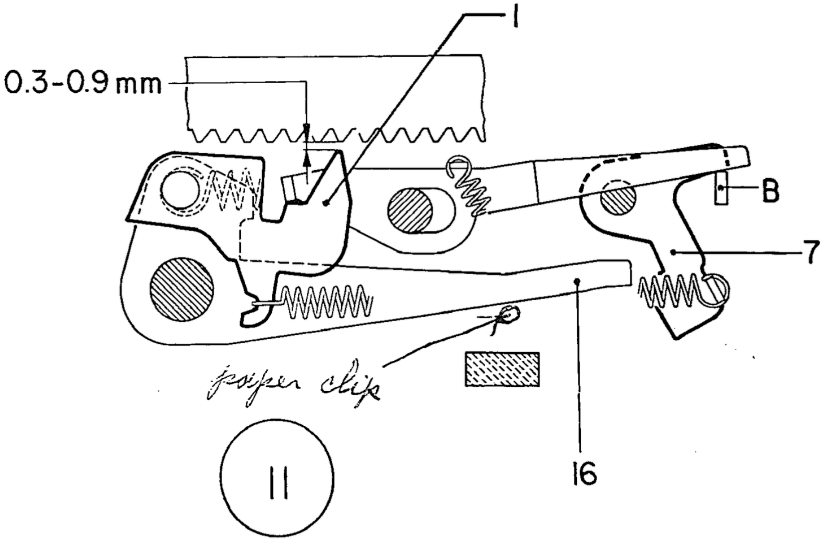
8


1
5
A
0.3mm (min.)
A
7
0.8-1.5 mm
16

9


0.2-0.5mm
E

10


1
0.3-0.9 mm
B
7
paper clip
16

11

SECTION 11

DEAD KEYS

INTRODUCTION TO DEAD KEYS

The dead key is an optional feature which allows specific characters to be printed without carriage spacing. This feature is necessary in a language which requires the use of accents, such as the accent over the e in the word café. Dead keys operate the same as regular keys, except that the dead key does not release the escapement dog from the escapement rack.

COMMAND MECHANISM

The command mechanism of a dead key performs the following actions:

- Selects the required type bar mechanism
- Activates the print cam clutch

ASSEMBLY (REST POSITION) (Figure 1)

The bell crank (8) of a dead key has a lug (A) facing the comb (1). The comb is held in contact with the lug (A) through tension of the spring on the link (2). The link positions the hook (B) of the interposer bridge (3) clear of the wing of the arm (4). The arm is attached to the escapement trip shaft.

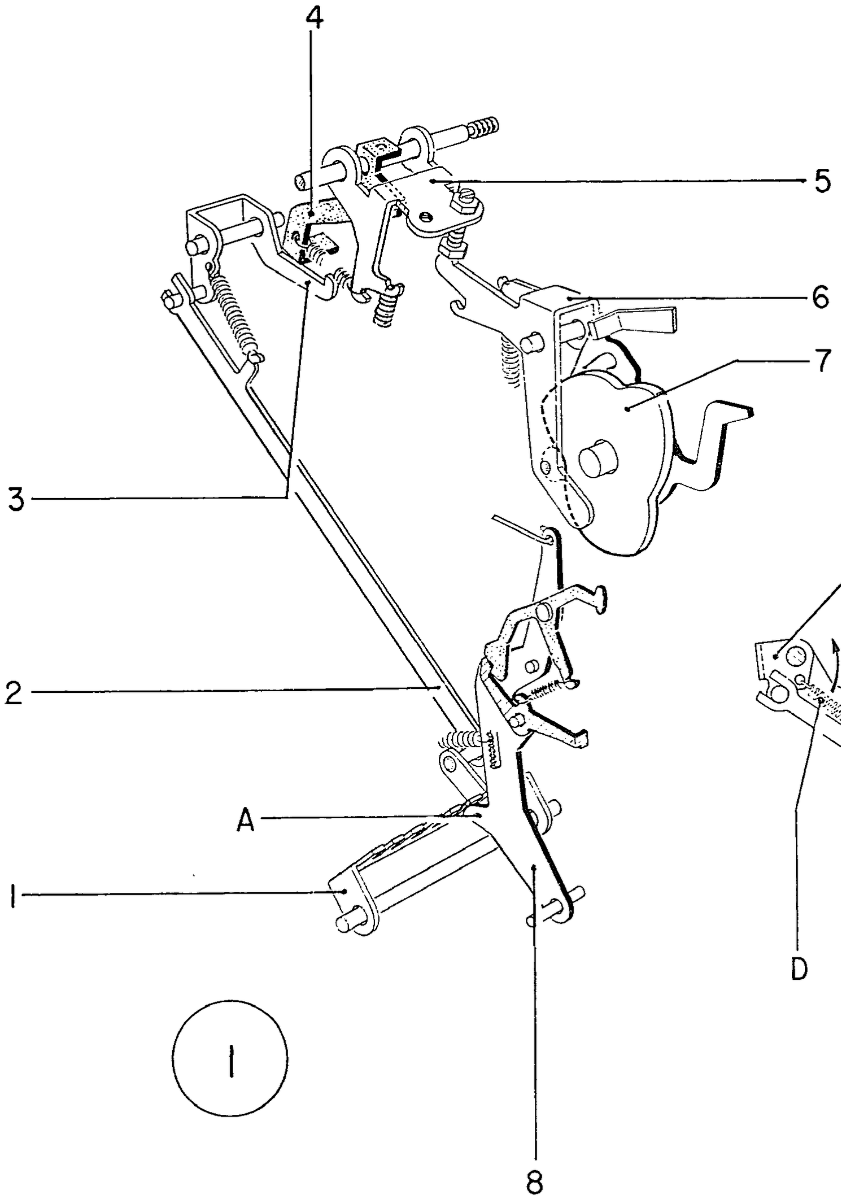
ACTIVATION

To prevent the escapement trip occurring during a dead key print cycle, the hook (B) of the interposer bridge (3) must intercept the arm (4). This is accomplished as follows (refer to figure 2):

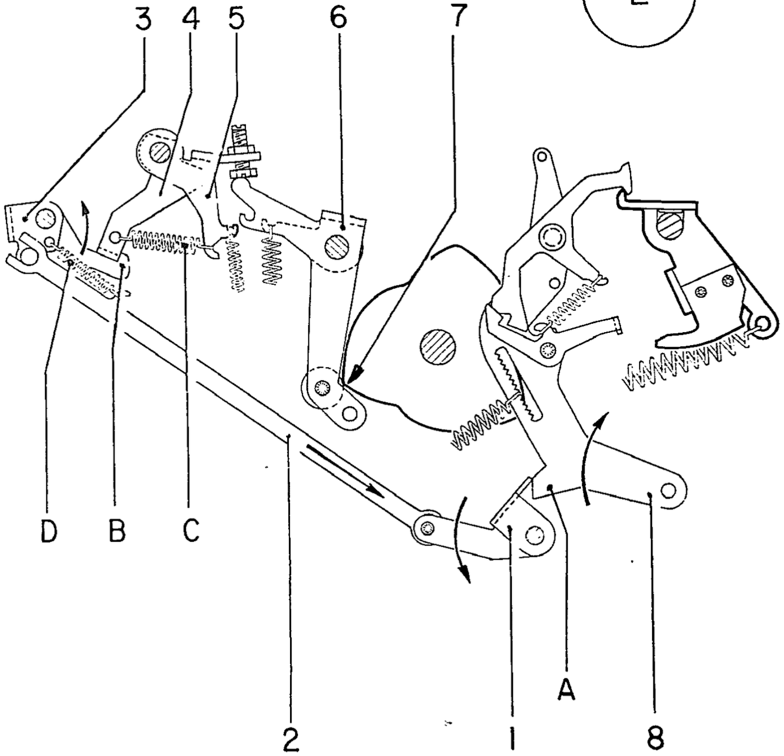
- As the bell crank (8) rotates, its lug (A) will rotate the comb (1). This movement, through the link (2) and the connecting spring (D), rotates the interposer bridge (3), placing the hook (B) directly in front of the wing of the arm (4).

- During the cycle, the cam (7) rotates the escapement trip lever (6) and the escapement trip intermediate bridge (5) in the normal manner.

- Through the action of spring (C) the arm (4) tries to rotate the escapement trip shaft. However, because the hook (B) is in the path of the wing of the arm (4), the escapement trip shaft is prevented from rotating, and the spring (C) yields. As a result, the selected character prints, but the carriage does not move.



①



②

SECTION 12

SHIFT MECHANISM AND RECIPROCAL LOCK

INTRODUCTION TO SHIFT MECHANISM AND RECIPROCAL LOCK

There are 45 type bars in the Editor 4 machine. Soldered to each type bar is a type slug which has two printing surfaces (A and B), resulting in 90 different characters (figure 1).

The characters in the A position are known as upper case or capital letters.

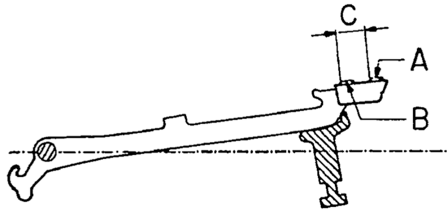
The characters in the B position are known as lower case or small letters.

To print either the upper case or lower case characters on the same writing line, it is necessary to move the type bars and segment up or down (figures 2 and 3).

The distance (C) through which the segment moves during a shift operation is known as the "motion."

For the segment to move from lower case to upper case position, or vice versa, the shift key must be operated to control the activation of the shift mechanism. While the segment is in motion, a reciprocal lock prevents a character key from printing until the segment motion is completed.

Before examining the shift mechanism, the segment structure will be covered.



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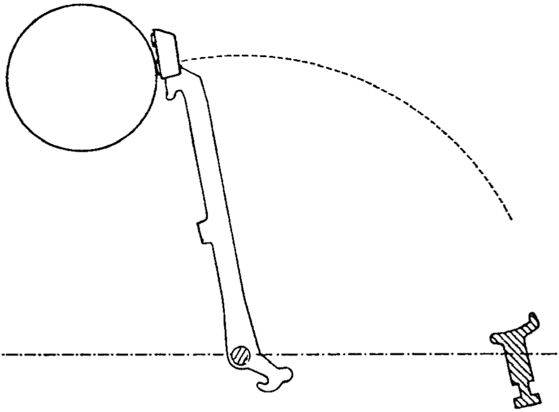
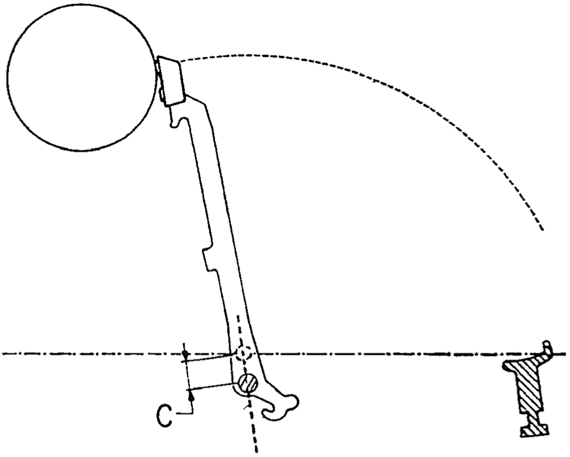


②



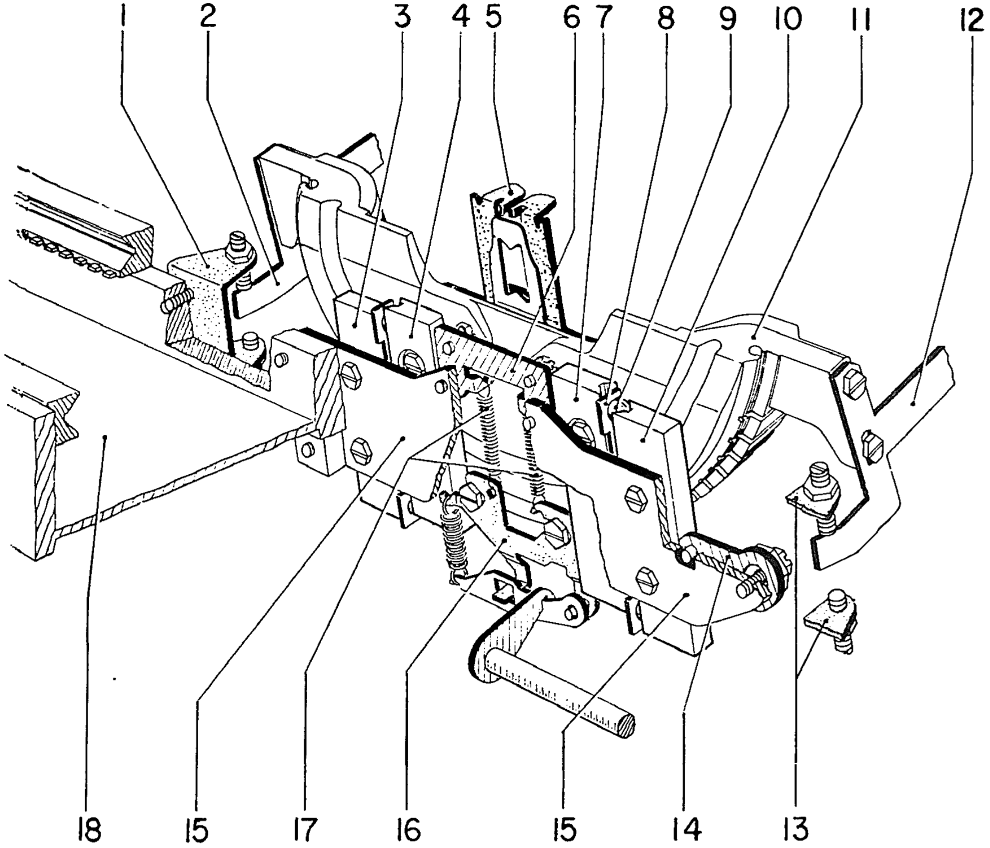
③

SEGMENT ASSEMBLY

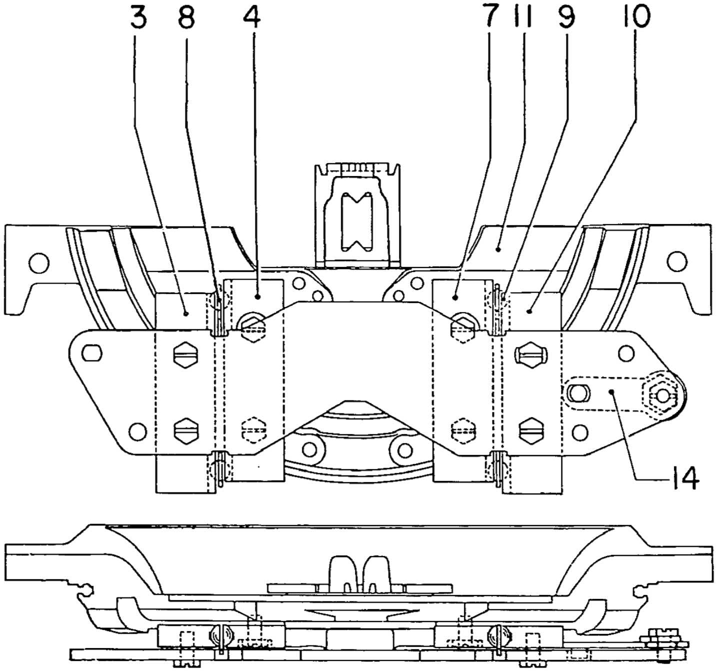
The assembly of the segment is as follows (figures 4 and 5):

- The segment (11) supports the 45 type bars. The type bars are held in the segment slots by a fulcrum wire on which they pivot. The type guide (5) guides the type bars to the printing point. Secured to the rear of the segment are two inner raceways (4 and 7) with V-shaped guide slots.
- The segment bracket (15) is attached to the carriage fixed rail support (18). Assembled on the segment bracket are two outer raceways (3 and 10), also with V-shaped guide slots. The outer raceway (10) is adjustable and is regulated by the adjustable plate (14).
- Positioned between each of the inner and outer raceways are two ball bearings (9) and their retaining plate (8). This ensures a smooth up and down travel of the segment (11).
- When the segment is up, it is in the normal rest position for the printing of the small or lower case characters. This position is established by the two arms (2 and 12) limiting on the upper motion adjusting screws which are fitted on the brackets (1 and 13). Both brackets are fastened to the carriage fixed rail support (18).
- The segment is held in the up position through the tension of the two springs (17). The springs are hooked between the plate (6), which is attached to the bracket (15), and the anchor plate (16) which is attached to the segment.

4



5



COMMAND MECHANISM

The function of the shift command mechanism is to activate and control the shift cam group to raise or lower the segment.

Depression of a shift key or the shift-lock key causes the following:

- Engagement of the clutch of the shift cam group to operate the shift drive mechanism.
- Presetting of the mechanism for disengagement of the clutch when the segment has reached the upper case position.

Release of the shift key causes the following:

- Re-engagement of the shift cam clutch to reactivate the shift drive mechanism.
- Presetting of the mechanism for disengagement of the clutch when the segment has returned to the lower case position.

ASSEMBLY (REST POSITION)

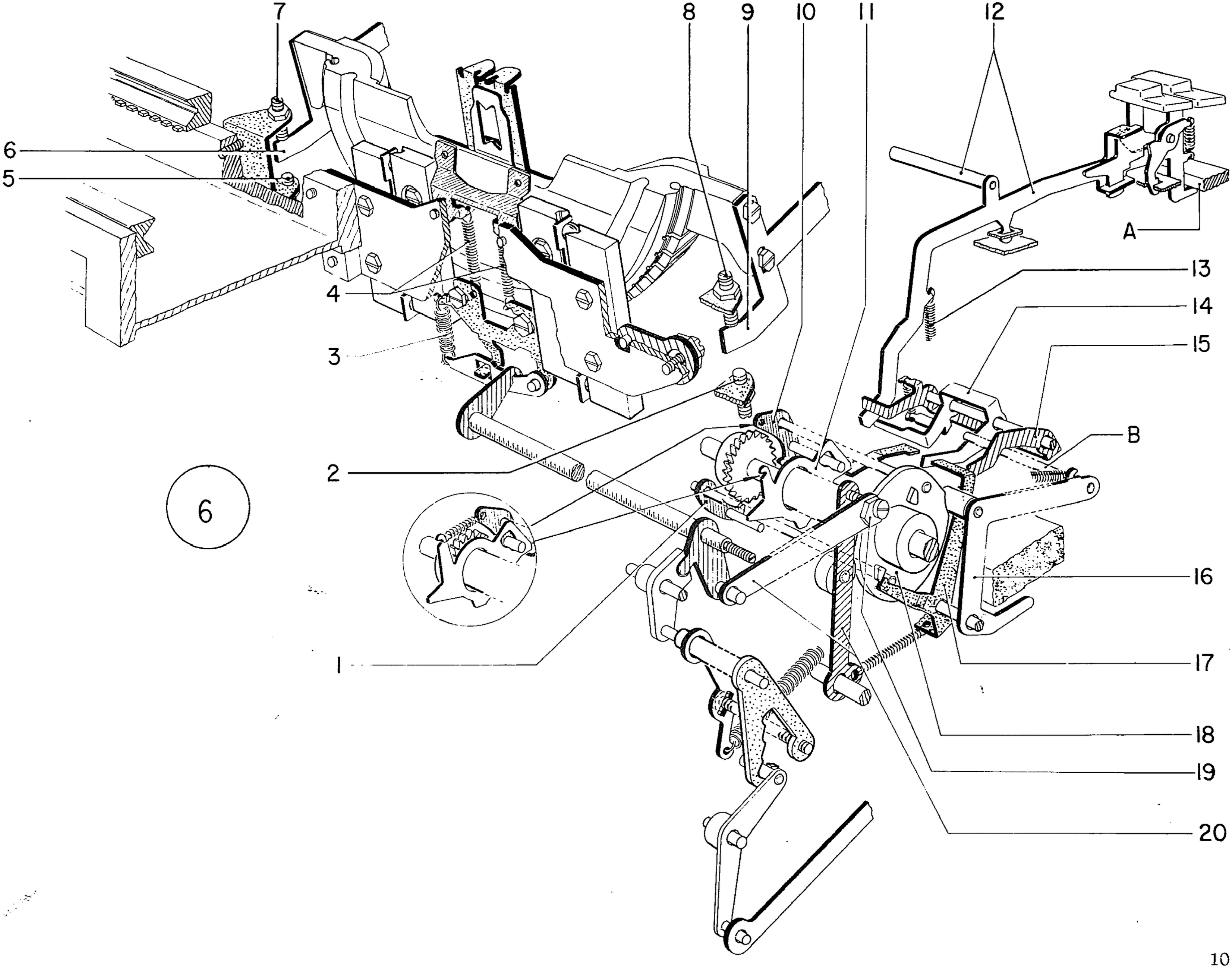
Figure 6 illustrates the shift mechanism at rest with the segment in the lower case position.

Both shift key levers (12) rest against the rubber cushion (A), through the action of the spring (13) on the left shift key lever.

In this position, the rear of the shift key lever (12) holds the trip bridge (15) in position to control the shift cam starting lever (17).

The starting lever (17) holds the flange (11) which, in turn, keeps both ratchet pawls (1 and 10) disengaged from the ratchet of the shift cam (18).

The roller of the interposer crank (16) is in the dwell of the shift cam (18), establishing the angular rest position of the cam in lower case. In this position the pin (B) of the interposer crank (16) holds the arm of the intermediate trip bridge (14) below the wing of the starting lever (17).


A
B

Command Mechanism - Shifting From Lower Case to Upper Case.

Figure 7 illustrates the shift command mechanism at rest position.

In figure 8 the shift key (4) has been depressed and its rear extension has rotated the trip bridge (6). The trip bridge released its hold on the starting lever (1), which rotated through the action of its spring, and limited against the hub of the shift cam (2). This action caused the shift cam clutch to engage.

Figure 9 shows the shift cam (2) after it has almost completed 180 degrees of rotation.

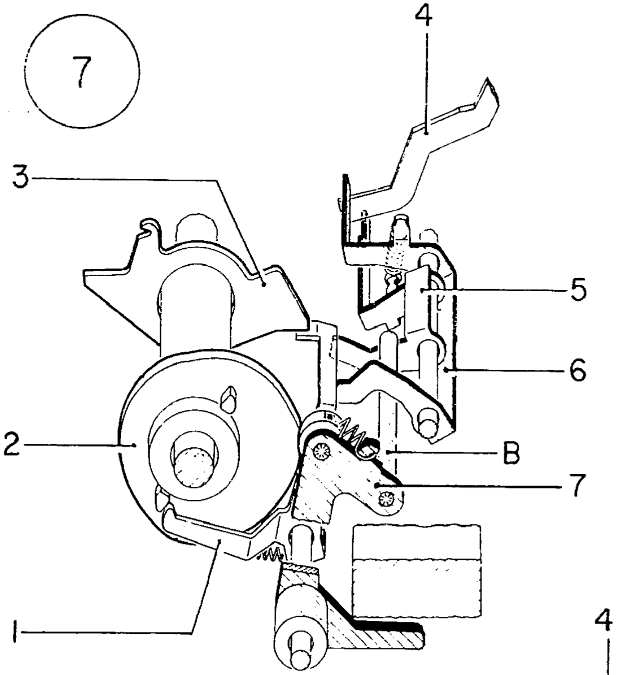
- The lobe (A) of the cam (2) has restored the starting lever (1) to engage the flange (3), thus presetting the disengagement of the clutch.
- The profile of the cam (2) has left the roller of the interposer crank (7) which, actuated by its spring, has rotated against the bell crank casting (C).

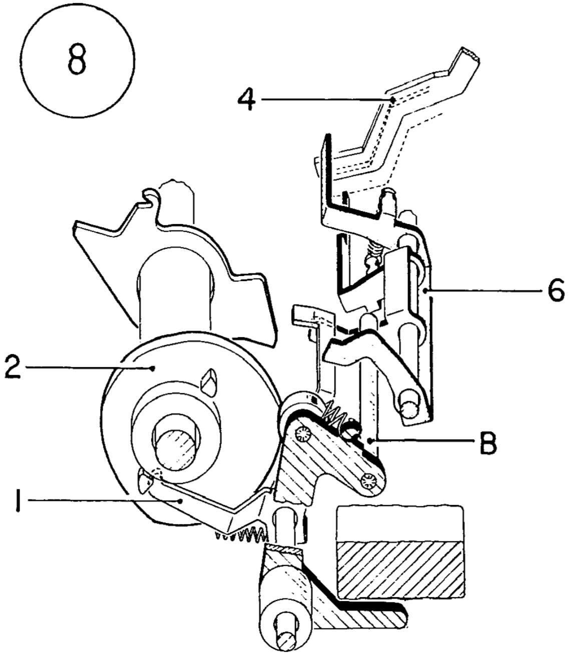
As a result of crank (7) movement, the pin (B) of the interposer crank (7) presets the intermediate trip bridge (5) to maintain a hold on the starting lever (1).

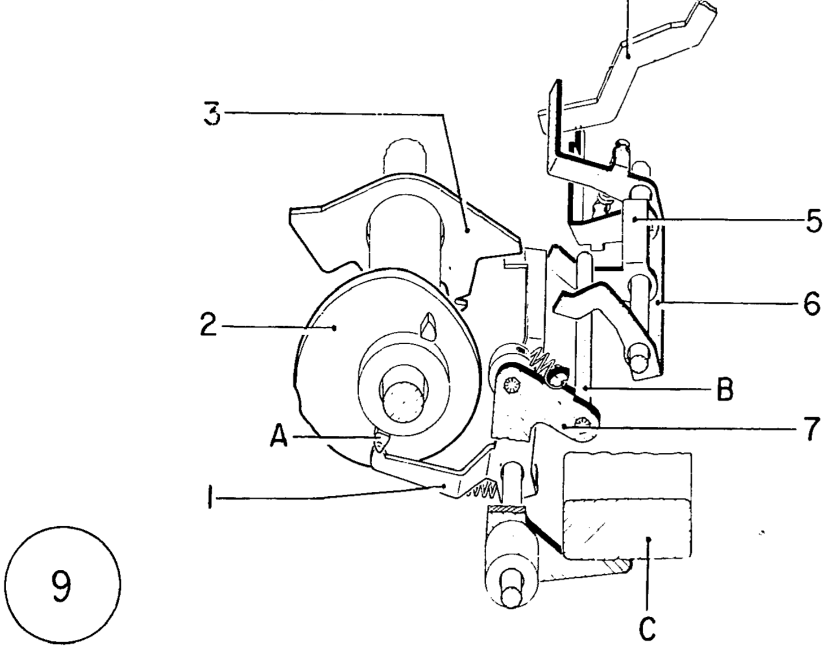
In figure 10 the shift cam has completed a 180-degree rotation.

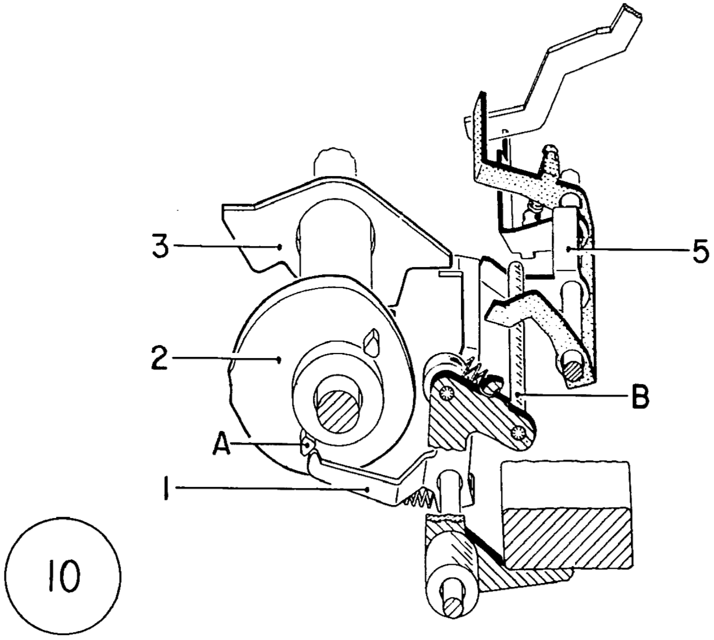
The lobe (A) of the cam (2) has passed by the arm of the starting lever (1) which can now rest against the intermediate trip bridge (5). The starting lever is in the path of the flange (3), and has stopped the shift cam group after a rotation of 180 degrees.

Through this movement, the shift mechanism will lower the segment into the upper case position.


B


B


B
A
C


B
A

Segment - From Lower Case to Upper Case.

The activation of the shift mechanism performs the following functions:

- Lowering of the segment.
- Increase of the tension of the printing spring to maintain equal typing impression between the upper case and lower case characters.

In the upper case position, the segment is resting on the lower motion adjusting screws of the brackets (8 and 9). The segment is held in this position through the following parts:

- The shift cam (10)
- The shift drive arm and link (11)
- The segment shift shaft (5), coupling (6) and spring (7)

The following parts are concerned with the impression compensation in upper case.

- The crank (4) and the impression control arm (2)
- The impression control detent crank (1)

To lower the segment, the shift shaft (5) is rotated in the direction of the arrow. To increase the typing impact, the crank (4) and anchor arm (3) are rotated in the direction of the arrows to increase the tension of the printing spring (12).

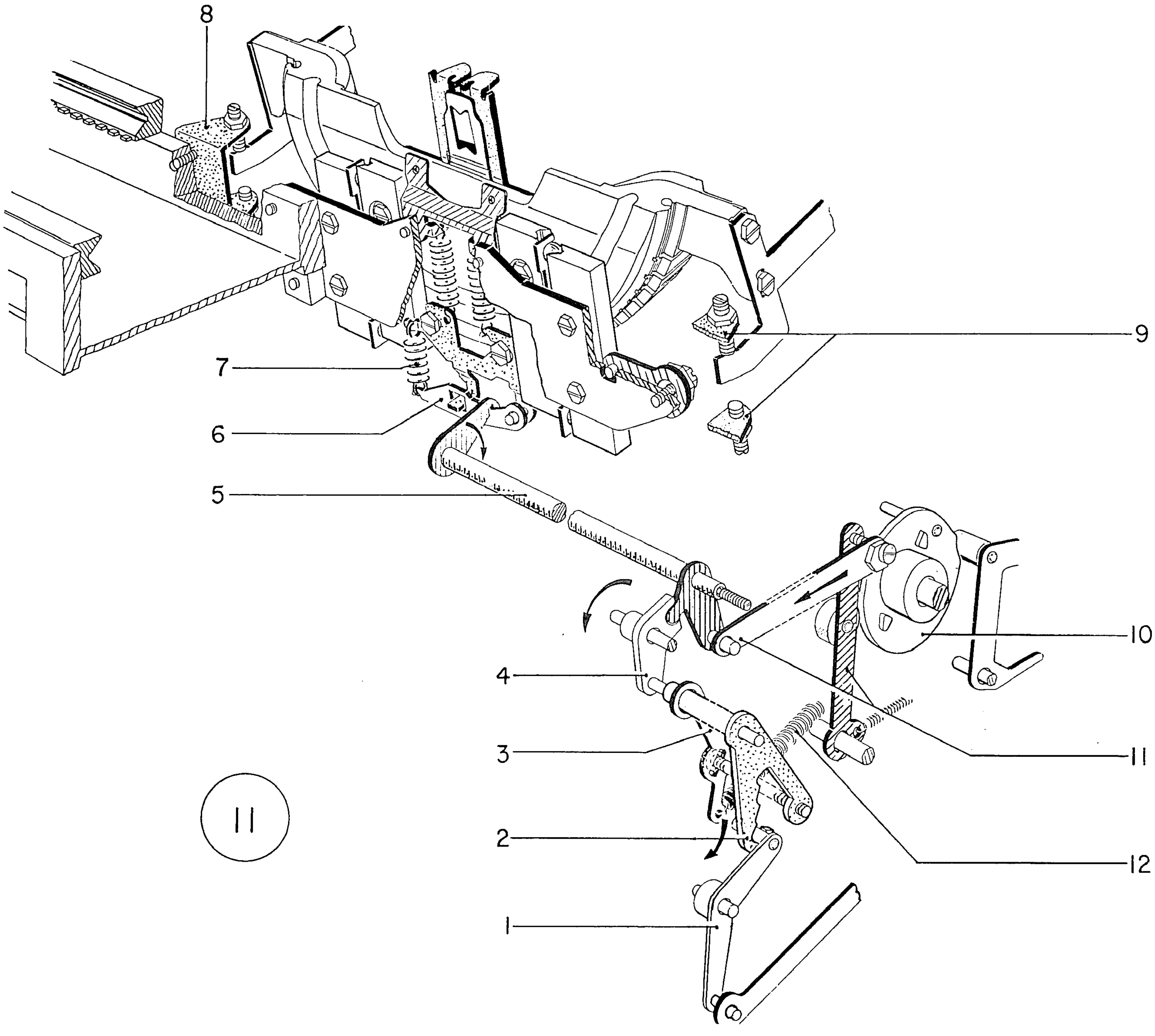
These operations are accomplished through the shift cam (10) in the following manner:

- The 180-degree rotation of the shift cam (10) pushes the shift drive arm and link (11) in the direction of the arrow.

- The segment shift shaft (5) lowers the segment through the coupling (6) and spring (7) until the segment arms limit against the lower motion adjusting screws of the two brackets (8 and 9).

- The downward travel of the segment is stopped before the final rearward movement of the shift drive arm (11), therefore, the spring (7) yields slightly.

- The rotation of the segment shift shaft (5) actuates the crank (4) and anchor arm (3) to effect impression compensation. (This action is illustrated in figures 12 and 13.)


8
9
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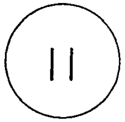
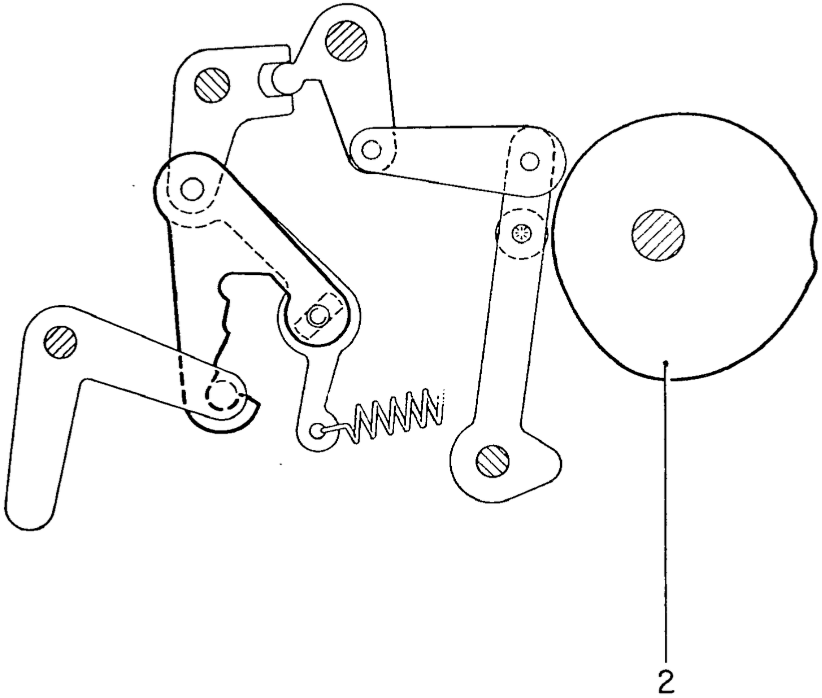
12
1


11

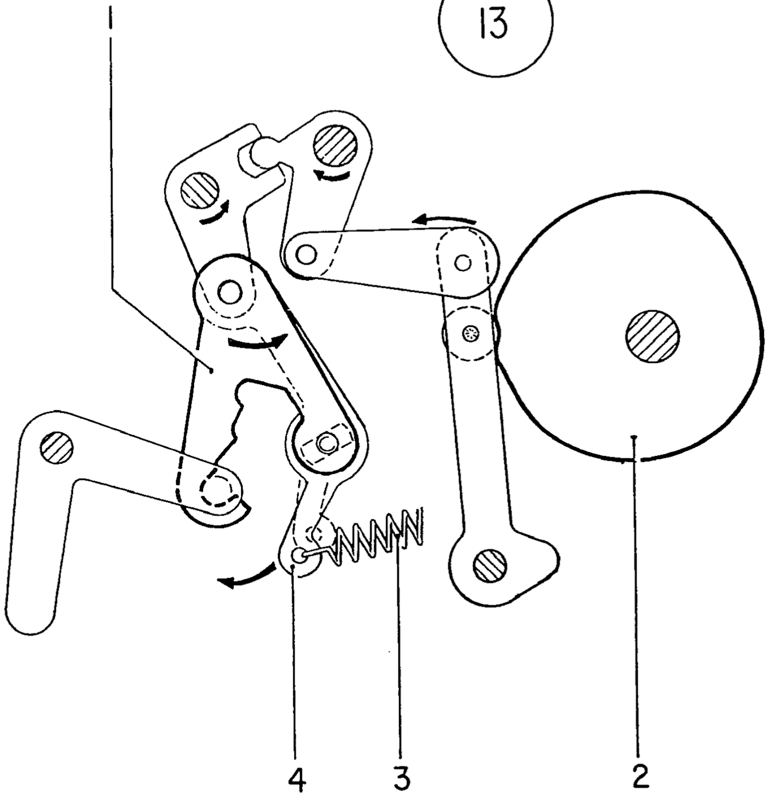
In figure 12 the shift cam (2) is shown in the lower case position.

In figure 13 the shift cam (2) is shown in the upper case position. The anchor (4) of the impression control arm (1) has rotated from the dotted outline position, increasing the tension of the printing spring (3).

12



13



Command Mechanism - Shifting From Upper Case to Lower Case.

Figure 14 illustrates the shift command mechanism at rest, with the segment in upper case (lower position).

The flange (1) is held by the starting lever (2), and the starting lever, in turn, is held by the intermediate trip bridge (4). At the same time, the trip bridge (5) is held up by the shift key lever (3).

Figure 15 indicates that the shift key has been released.

As the shift key was released, the rear of the shift key lever (3) lowered the intermediate trip bridge (4), causing it to release its hold on the starting lever (2). The starting lever, pulled by its spring, has released its hold on the flange (1), and the shift cam clutch has closed, allowing the shift cam to rotate its second 180 degrees.

When the shift key was released, the movement of the shift key lever (3) allowed the trip bridge (5), under the control of the stud (A), to rotate until it came to rest on the top of the released starting lever (2).

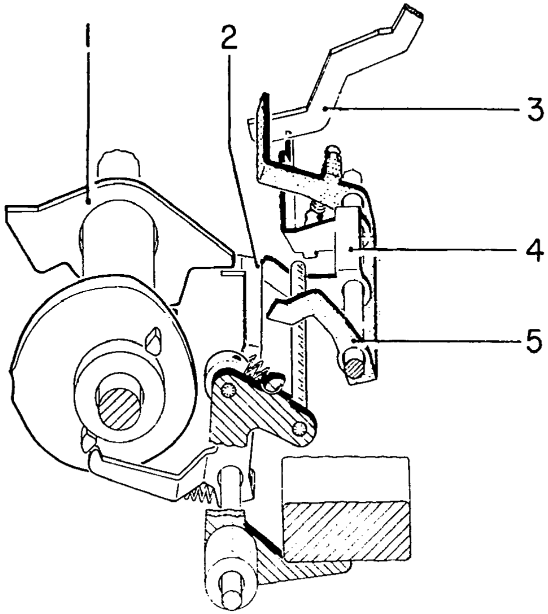
Figure 16 shows that, as the shift cam rotated, the lobe (B) has fully restored the starting lever (2). With the starting lever in the fully restored position, the trip bridge (5) completed its rotation, and is now in position to hold the starting lever after it has passed the point of maximum restore.

Figure 17 shows the command mechanism back at rest.

The starting lever (2) is holding the flange (1), and the starting lever, in turn, is held by the trip bridge (5). The shift cam has completed its second 180-degree rotation, and the segment is now in lower case (upper position).

> Note: Refer to figure 6. During the upward travel of the segment, the shift cam group has relatively little load applied to it, since the segment is raised by the tension of two springs (4). The rapid upward movement of the segment can cause the roller of the shift drive arm to accelerate the shift cam faster than the power shaft. This action could cause the shift cam ratchet pawl (10) to disengage from the ratchet. To prevent this condition, the ratchet pawl (1), which is engaged in the opposite relationship to the pawl (10), keeps the cam coupled to the ratchet.

14



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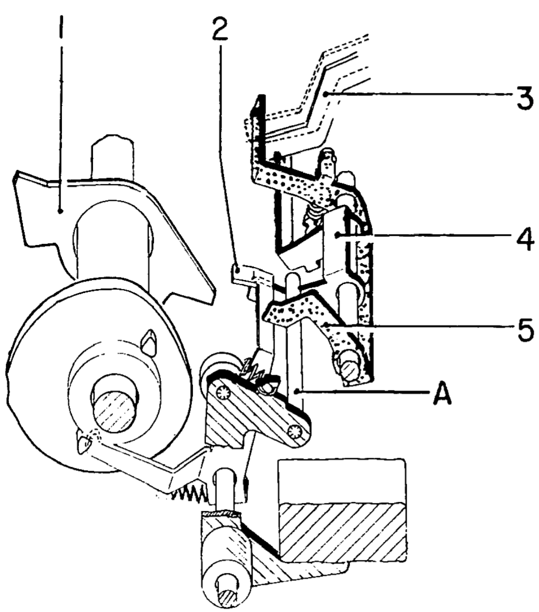

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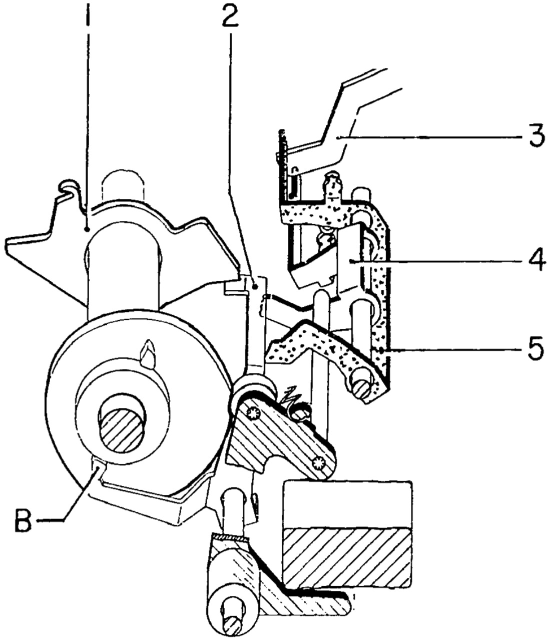
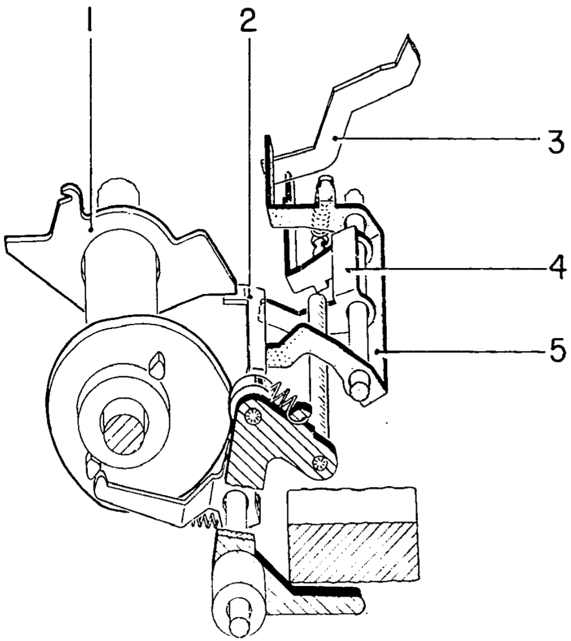


17



SHIFT LOCK

Continuous typing of capital letters is conveniently obtained by maintaining the segment in the upper case position by use of the shift-lock key.

ASSEMBLY (REST POSITION)

The parts assembled on the shift key (1) are:

- Shift lock key (2)
- Latch (5)

Figure 18 shows the shift key lever (1) held at rest against the rubber pad (3) through the tension of its spring.

ACTIVATION

Figure 19 shows that the shift-lock key (2) has been depressed. This caused:

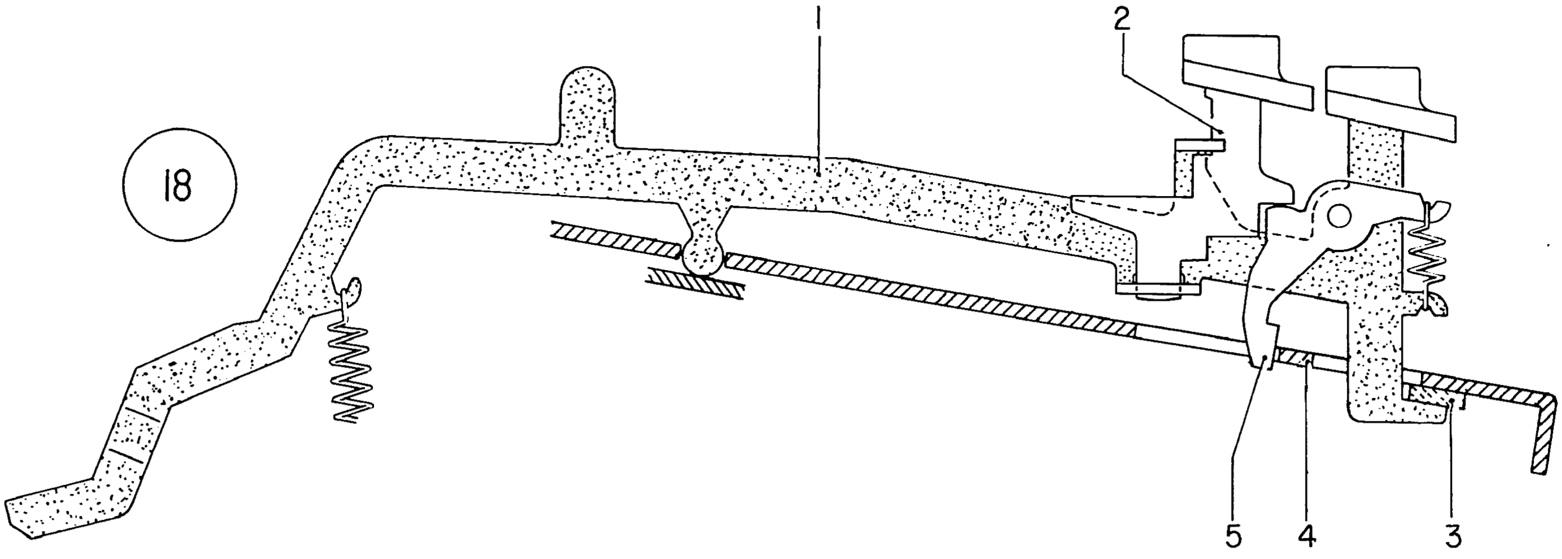
- The shift key (1) to lower.
- The latch (5) to position under the keyboard housing plate (4).

By releasing the shift-lock key, the latch (5) holds the shift key lever (1) down, and the segment in the upper case position.

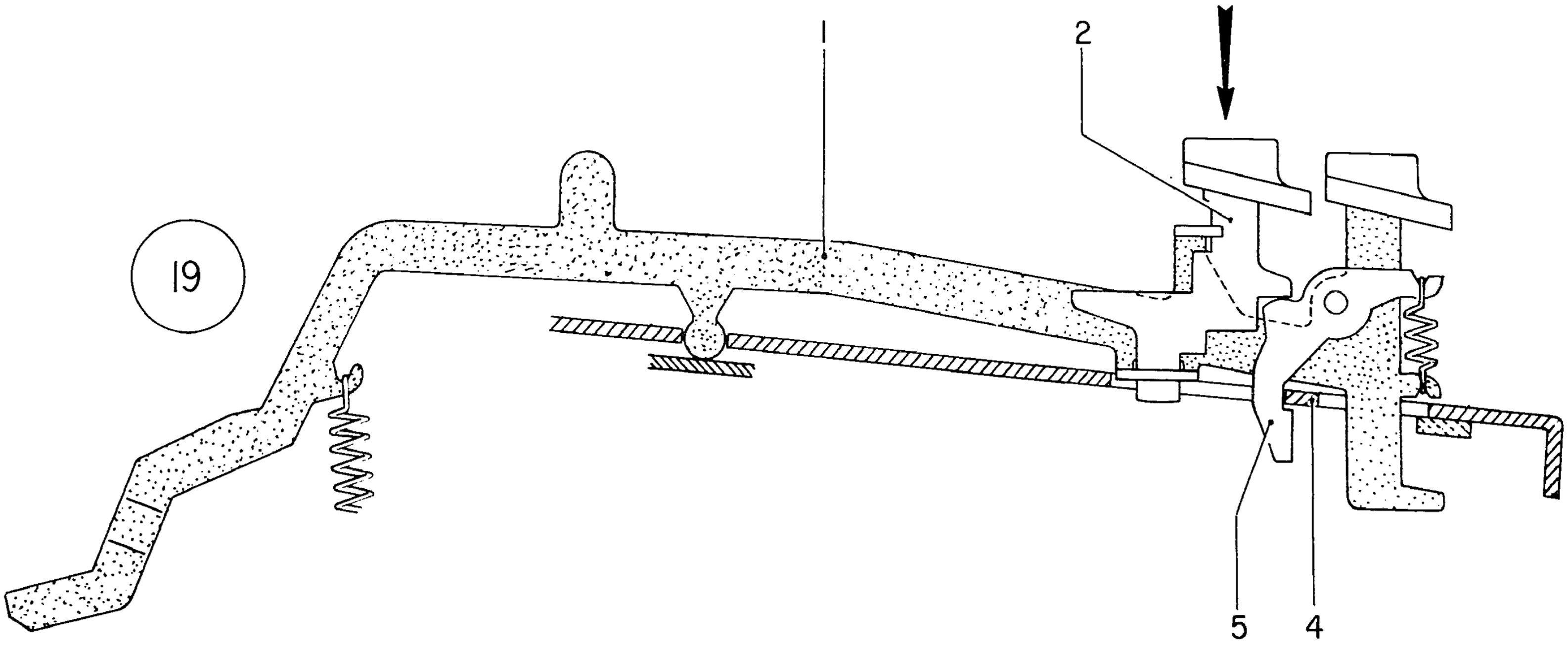
RELEASE

By depressing the shift key (1), the latch (5), actuated by its spring, releases from the keyboard plate (4), and the shift key (1) returns up through the tension of its spring. The segment returns to the lower case position.

18



19



RECIPROCAL LOCK BETWEEN PRINTING AND SEGMENT SHIFT

To prevent printing during a segment-shift operation, a reciprocal lock is provided between the type-action and segment-shift mechanisms. This eliminates any possibility of "flying caps." The reciprocal lock makes it impossible for a type bar to rise while the segment is in motion. Conversely, movement of the segment is prevented during a printing cycle. Either action, if activated while the other is in operation, will be held in memory until completion of the first action.

ACTIVATION

Segment in Motion, Type Action in Memory.

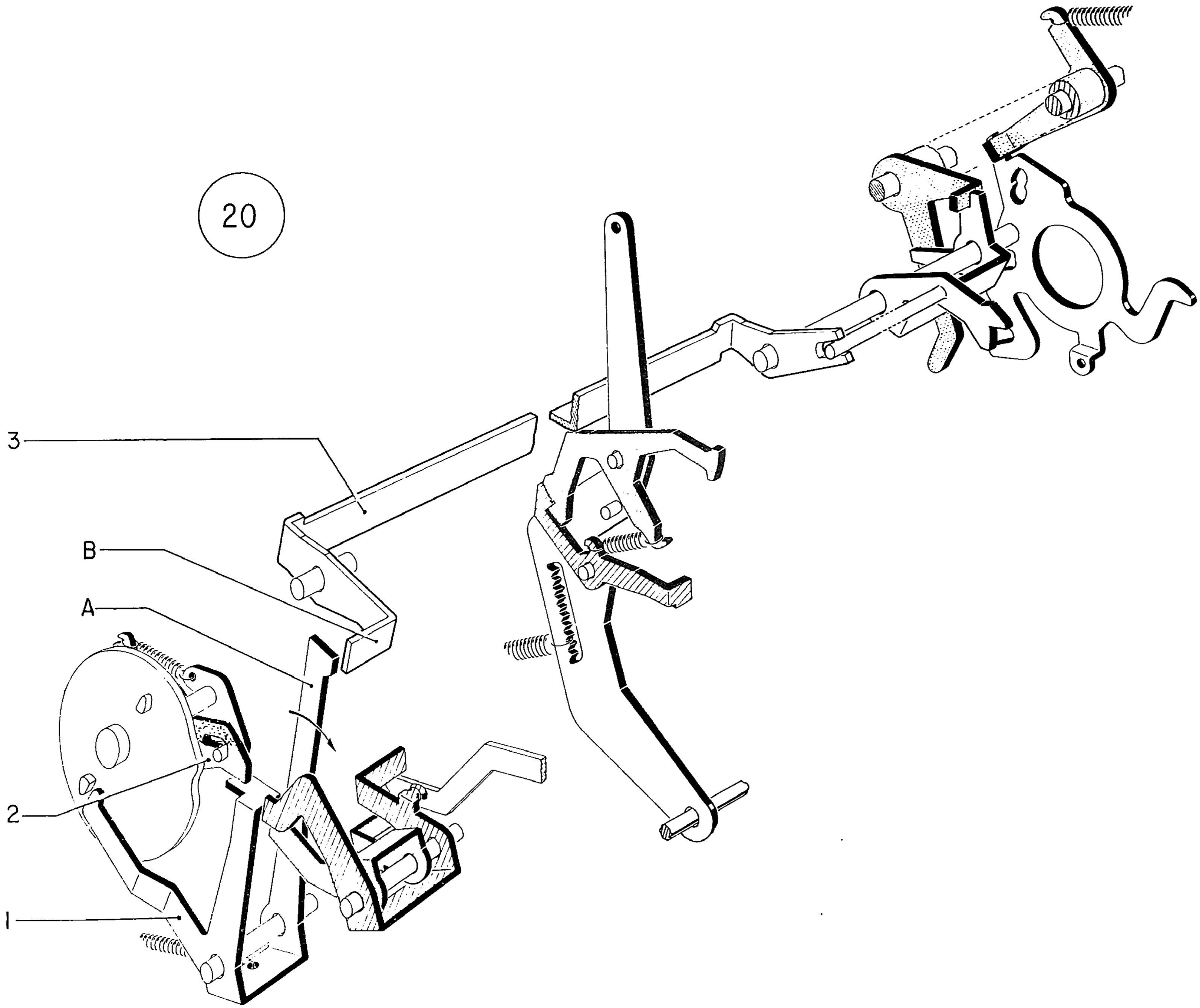
When shifting from lower case to upper case, or vice versa, the shift cam starting lever (1) rotates and positions its extension (A) under the wing (B) of the print cam activating bail (3).

By depressing a character key, the activating bail (3) rotates only a short distance before it is stopped by the extension (A) of the starting lever (1). This short rotation does not permit the print cam clutch to engage until the shift cam starting lever (1) returns to rest. Therefore, the printing is retained in memory until the segment completes its travel.

Printing in Action, Segment Shift in Memory.

During a printing cycle, the wing (B) of the print cam activating bail (3) moves down into the path of the extension (A).

If at this time the shift key was depressed, the shift cam starting lever (1) could only rotate a short distance before it was stopped by the wing (B). This short rotation would not permit the release of the flange (2) until the activating bail (3) returns to rest. Consequently, the shift cycle is retained in memory until the character has been printed.


B
A

SECTION 13

CARRIAGE STRUCTURE

CARRIAGE STRUCTURE

The carriage frame consists of the two outer side plates (1 and 9) which are integral with the roll rail frame (14).

The movable inner side plates (2 and 6) are mounted on their respective outer side plates (1 and 9) by the studs (A). (Only the right side is shown in the figure.)

The platen position shaft (5) extends through the bushing holes in the two inner side plates and through the openings in the outer side plates.

Attached to the shaft (5) are two cams (4 and 8) with identical profiles. The cams, being held against the fixed pins (B) of the outer side plates by the tension of the springs (3 and 7), establish the position of the inner side plates.

The platen shaft bushings (12) rest on the extension of the outer side plates, and also against the inner side plates. The platen shaft is secured in position by the platen lock levers (11 and 16).

The lateral position of the platen is established by the guide bracket (13) which engages the groove of the platen shaft.

PLATEN POSITIONING

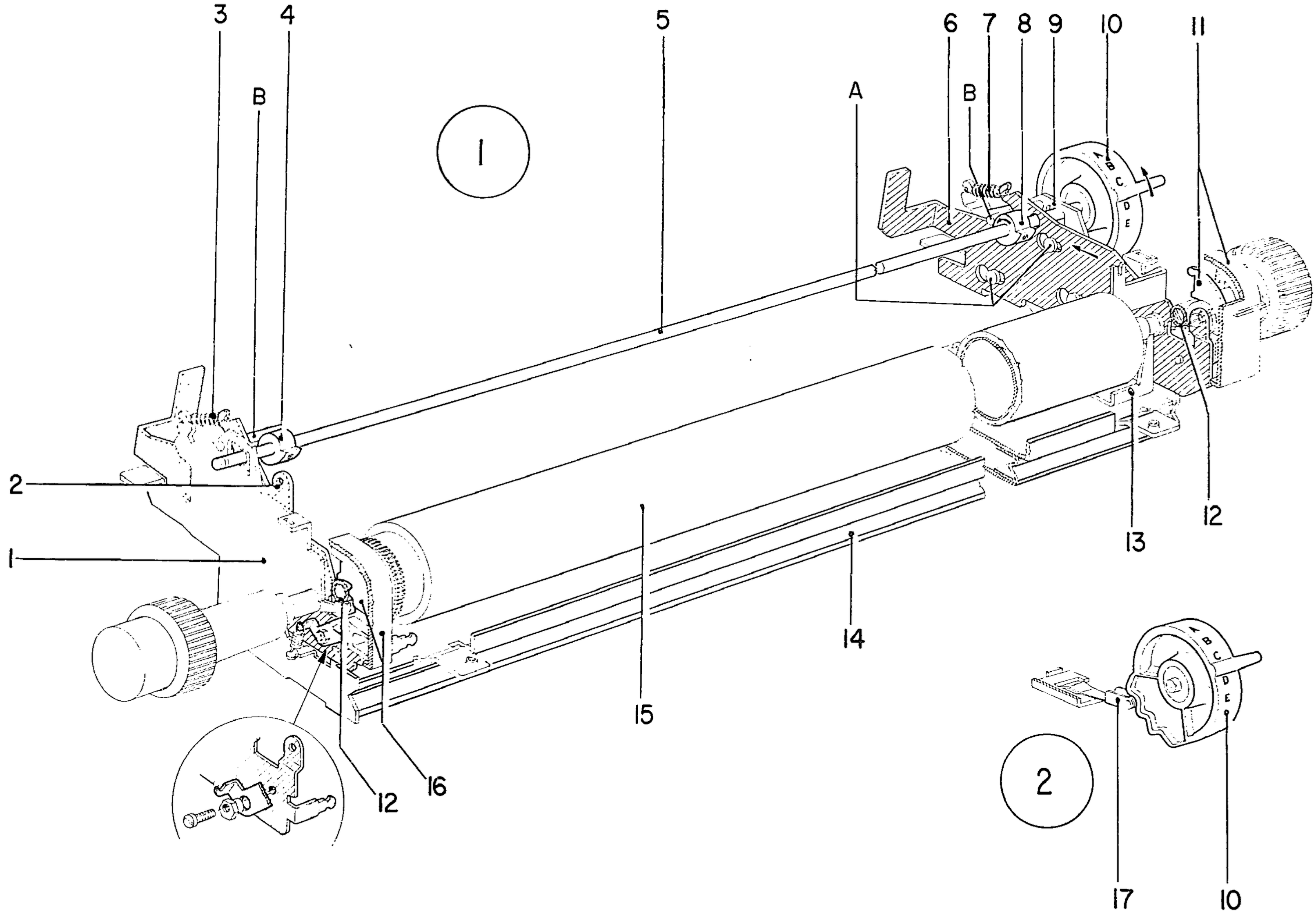
The front to rear position of the platen (15) is regulated by the operator according to the number of copies being prepared.

Rotation of the platen position dial (10) causes the cams (4 and 8) to move the inner side plates together with the platen.

Figure 2 illustrates the detent lever (17) which securely holds the dial (10) and, in turn, the platen in any of its five positions.

REMOVABLE PLATEN

The platen can be removed by releasing the platen lock levers (11 and 16).


A
B
A B C D E

SECTION 14

PRINTING ADJUSTMENTS

INTRODUCTION TO PRINTING ADJUSTMENTS

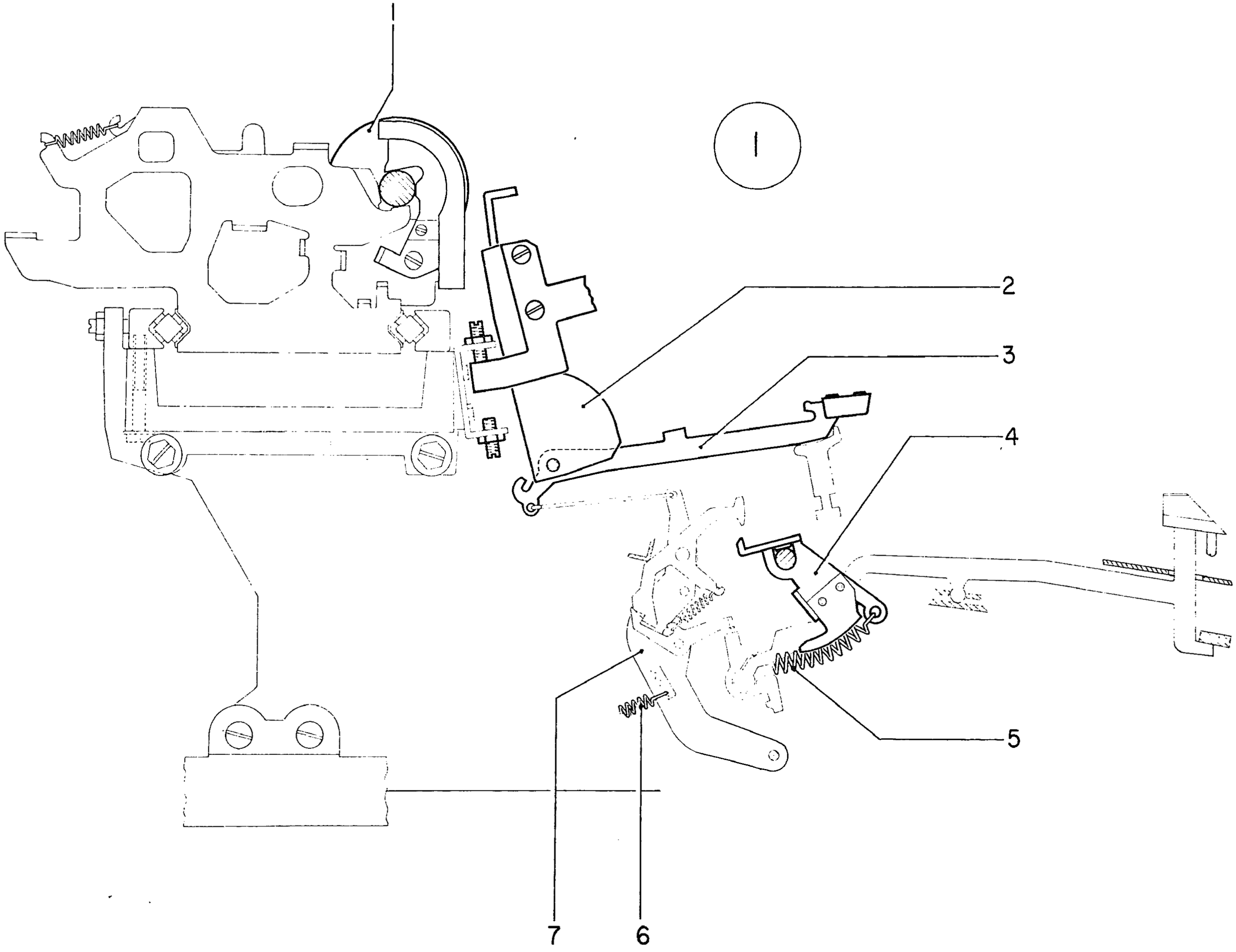
This section covers the mechanisms and the related adjustments required to achieve perfect printing. The objective is to produce typewritten copy with the best possible alignment and uniformity of impression. Even though manufacturing tolerances are closely maintained, these adjustments assure that the best possible printing is obtained from each character.

Figure 1 illustrates in schematic form, the mechanisms responsible for producing the outstanding quality of work achievable with the Editor 4.

- The platen (1) is adjustable back or forth to obtain the condition referred to as "ring and platen."
- The segment (2) is adjustable both in its height and travel, and controls the conditions referred to as "type-on-feet" and "motion."
- The printing spring (5) of the type-action bail (4) supplies the force to raise the type bar (3) to the printing point. The impression control spring (6) attached to the bell crank (7) opposes the action of the printing spring (5), and can be regulated to control the printing impact of its respective type bar.

Prior to performing the printing adjustments, the machine must have:

- A good quality ribbon installed.
- Correct ribbon feed and lift.
- Clean segment slots to ensure free travel of the type bars.
- A platen with resilient rubber and free of defects.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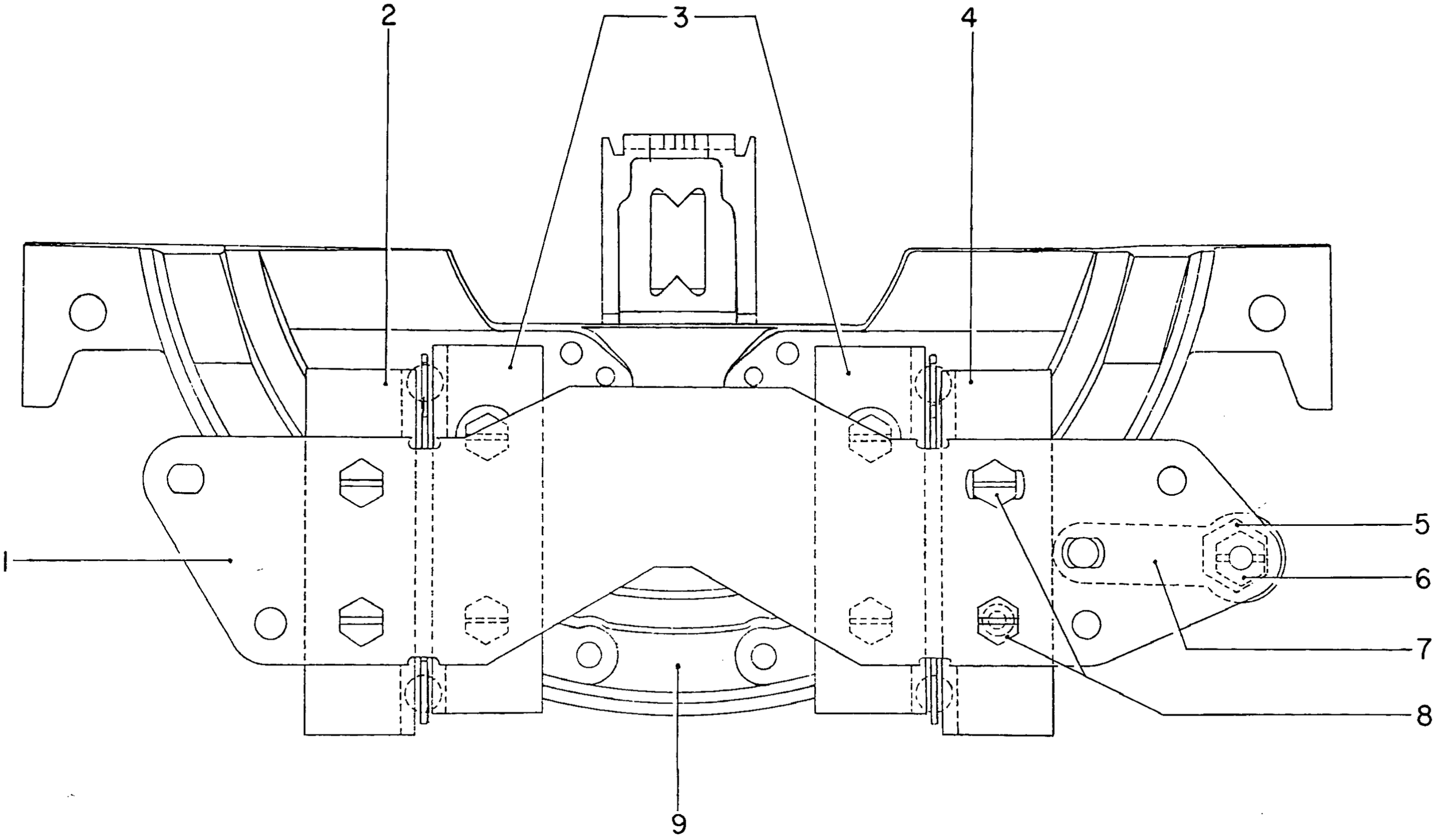
LATERAL POSITION OF SEGMENT ADJUSTMENT

To ensure a good line of write, the segment must move up and down freely and without side play.

The assembly is as follows:

- The two inner raceways (3) are attached to the segment (9).
- The two outer raceways (2 and 4) are attached to the carriage fixed rail support by the bracket (1).
- The left outer raceway (4) is adjustable by means of the plate (7) and the eccentric (5).

To obtain the free travel of the segment without side play, loosen the screws (6 and 8) and adjust the eccentric (5). Tighten the screws.



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PLATEN ADJUSTMENT TO INNER SIDE PLATES

The platen bushings (1 and 4) must be held secure between the inner side plates (2 and 7) and the eccentric disks (6 and 10) without front to rear play.

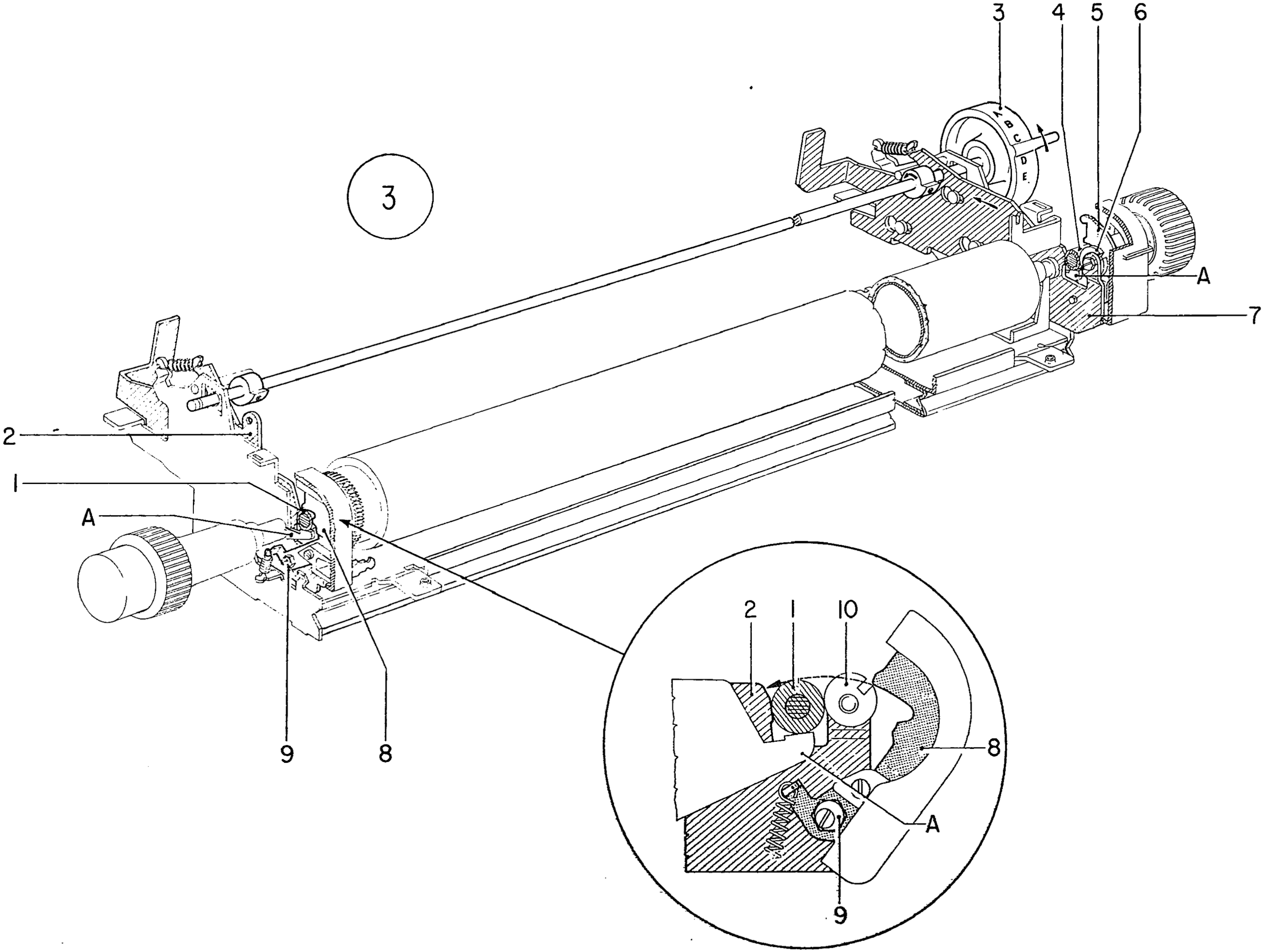
To adjust, regulate the eccentric disks (6 and 10), as required. (Refer to figure 3 and detail drawing.)

PLATEN LOCK LEVERS ADJUSTMENT

The platen lock levers (5 and 8) must hold the platen bushings (1 and 4) firmly against the extensions (A) of the outer side plates in order to maintain the proper height of the platen.

To adjust:

- Release the feed rolls.
- Release the memory line finder.
- Place the line space selector dial at 3.
- Regulate the platen lock lever eccentric (9) left or right, as required. (Refer to figure 3 and lower detail drawing.)
- Check that the platen can move back and forth freely when the platen position dial (3) is rotated.


A
B
C
D
E
A
A
A

RING AND PLATEN ADJUSTMENT

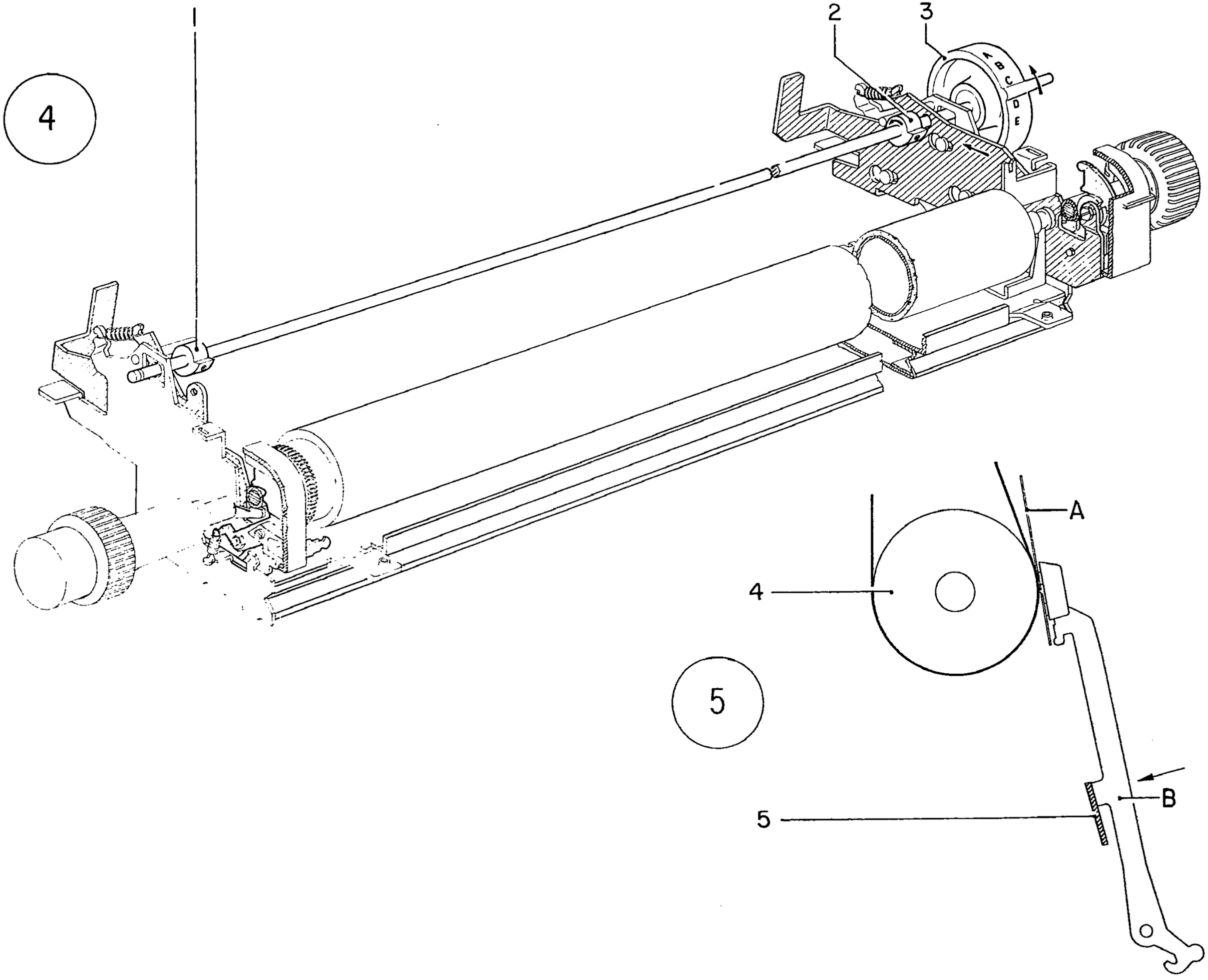
The term ring and platen expresses the relationship between the platen and the type face at the printing point. It is necessary to stop the type bar movement in such a manner as to permit printing without embossing or cutting the paper. This is accomplished by means of a steel ring (5) which is assembled on the segment. The boss (B) of the type bar contacts the ring (5) just before the type face contacts the platen (figure 5).

Before attempting the ring and platen adjustment, check the condition of the platen (4). The surface of the rubber must be in good condition. The platen must be perfectly round and the platen shafts must be straight and centered.

Check and adjust for proper ring and platen, at each end of the platen, as follows:

- Set the platen position dial (3) at "A".
- Insert a sheet of bond paper (0.08 mm thick) around the platen.
- Shift the segment to upper case position.
- Relieve the tension of the leaf spring located behind the type guide (not shown in the figures).
- Position the carriage at the start of the writing line.
- Raise a type bar by hand and hold it firmly against the segment stop ring (5) with your finger, as indicated by the arrow in figure 5.
- Using a strip of bond paper (A) as a gauge between the type face and the paper around the platen, check that there is a slight drag on the paper gauge (A) when it is pulled. Check that the majority of type bars conform to the above requirement.
- If adjustment is required, rotate the eccentric cam (1) which controls the movement of the left end of the platen.
- Position the carriage at the end of the writing line, and repeat the above procedure.
- If adjustment is required at the right end of the platen, rotate the eccentric cam (2).

> Note. Individual type bars that do not meet the above specifications must be adjusted in accordance with the regular type aligning procedure.


4
1
2
3
A
B
C
D
E
5
A
4
B
5

TYPE-ON-FEET ADJUSTMENT

Type-on-feet is the condition achieved when the printing surfaces of all the type contact the contour of the platen squarely, so that the characters print with uniform density from top to bottom.

The illustrations show the various relationships of the platen and the type face and their resulting impressions.

Figure 6 shows the platen and type face correctly positioned in relation to each other, thus producing a perfect impression.

Figure 7 shows a relationship in which the upper portion of the character contacts the platen first, resulting in the character printing light on the bottom.

Figure 8 shows a condition (opposite to that in figure 7) where the character prints light on top.

To check:

- Place one sheet of paper in the machine.
- Set the platen position dial at "A."
- Set the copies control dial at 1-4 copies.
- Type a series of upper case characters. The majority of characters must print with equal density top to bottom.

> Note. Individual type bars that do not meet the above specifications must be adjusted in accordance with the regular type aligning procedure.

To obtain the printing illustrated in figure 6, it is necessary to adjust the height of the segment since the vertical position of the platen is fixed.

Adjust as follows:

- Adjust the segment lower stop screws (2 and 5, figure 6, page 109).
- Check that the segment right and left stop arms (6 and 9, figure 6, page 109) contact their respective stop screws simultaneously.
- Recheck the condition of ring and platen.

YIELD OF SEGMENT SHIFT SHAFT COUPLING ADJUSTMENT

When the segment is lowered into the upper case position, it is stopped by the lower left and right adjustable stop screws. Since the segment shift cam attempts to drive the segment beyond its upper case position, the segment shift shaft coupling must yield slightly.

The yielding of the shift shaft coupling is obtained by adjusting the angular position of the eccentric (19, figure 6, page 109). The spring (3, figure 6, page 109) must yield by 0.5 to 1.5 mm when the high point of the shift cam profile has fully lowered the segment.

MOTION ADJUSTMENT

After it is established that the type-on-feet is correct for the upper case characters, then the lower case characters can be adjusted so that they print exactly on the same line as the upper case characters.

To adjust (refer to figure 6, page 109):

- Adjust the segment left and right upper stop screws (7 and 8), which limit the upward travel of the segment.
- Check that the segment stop arms contact their respective stop screws simultaneously.

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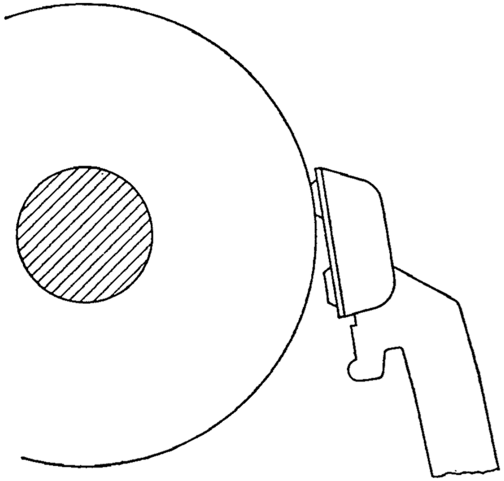

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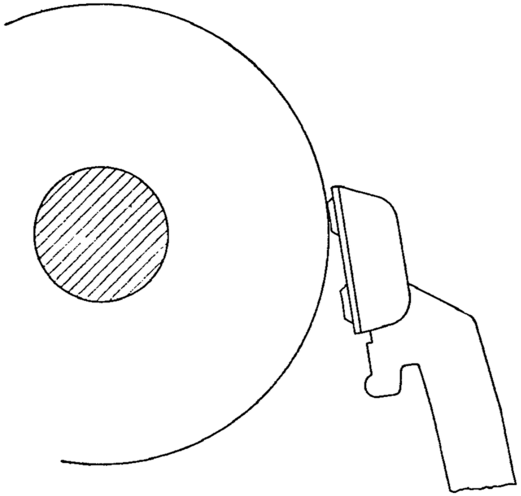

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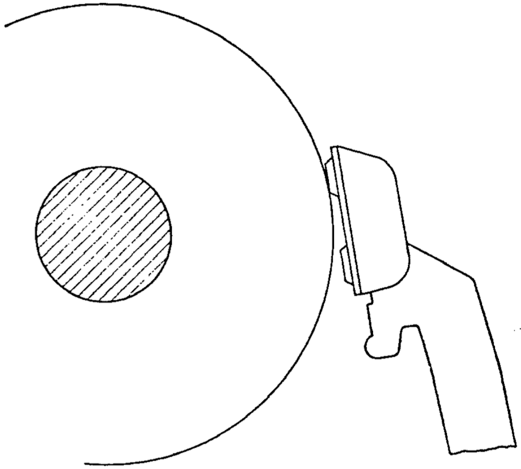

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IMPRESSION CONTROL ADJUSTMENT

As previously mentioned, the type bar impression is determined by the proper balancing of energy between the printing spring (10) and the opposing action of the individual impression control springs (8). The printing spring supplies a constant force for all characters. To compensate for the different surface area of each character, the opposing action of the individual impression control springs must be varied. This is accomplished by raising or lowering the position of the individual impression control springs on their respective bell cranks (9). The increase in surface area of the capital letters is automatically compensated for when the segment is lowered into upper case position. Lowering the segment stretches the printing spring (10).

The copies control dial (1) and the impression control arm (5) are simultaneously detented in each of their four positions by their respective detent arms (6 and 11). To obtain the proper detenting, adjust the eccentric (3) as required.

IMPRESSION CONTROL CHECK

- Set the copies control dial (1) at the 1-4 copy position.
- Set the platen position dial at the A position.
- Insert in the machine a carbon pack consisting of:
  - One sheet of bond paper.
  - Two sheets of copy paper.
  - Two sheets of medium-weight carbon paper.
- Type all the upper and lower case characters.
- Check that the type prints clearly and with uniform impression without embossing on the original copy.
- Check that the printing on the last carbon copy is perfectly legible and uniform in density.

ADJUSTMENT PROCEDURE

It is important that the impression adjustments be set so the type faces print perfectly with the least possible amount of impact.

- Preset the machine as indicated in the impression control check.
- Place the printing spring anchor (4) at its mid-range position (adjusting screw (7) centered in the elongated slot).
- Place the impression control spring (8) in the fourth notch from the bottom of the slot in the letter "h" bell crank.
- With the segment in lower case position, type the letter "h" several times. Check that the letter "h" prints on the last copy with sufficient impression to be clearly legible and that the original copy is not being embossed.
- If the above step conditions are not obtained, alter the tension of the printing spring (10) by adjusting the position of the anchor (4) as required.
- When the impression of the letter "h" is correct, alternately type each of the lower case characters with the letter "h". Check that all characters print with uniform density in relation to the letter "h" on both the original and last carbon copy.
- If individual adjustments are necessary, raise or lower the impression control springs (8) on the respective bell cranks, as required.

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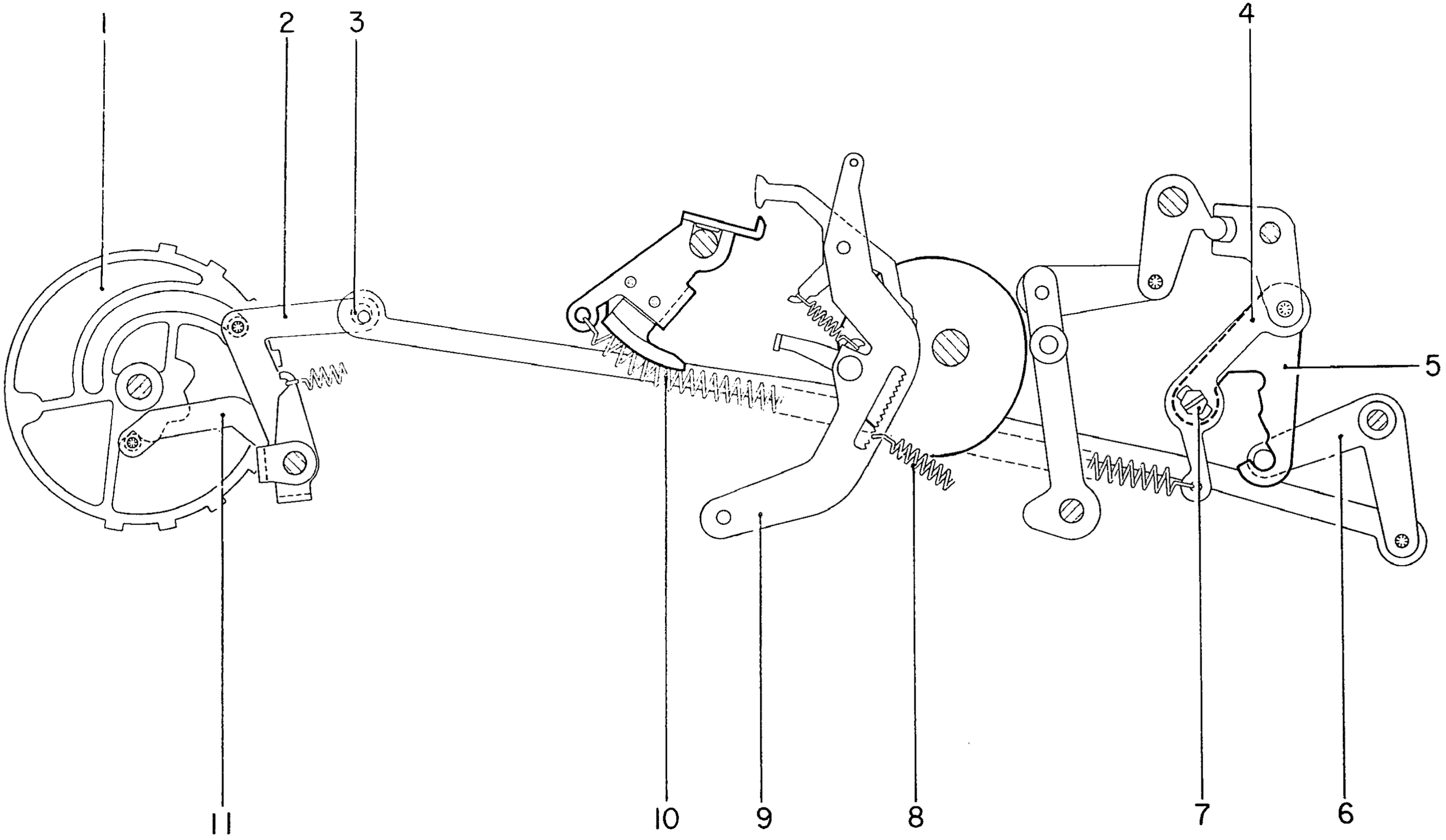


SECTION 15

SPACE BAR AND RECIPROCAL LOCK

INTRODUCTION TO SPACE BAR AND RECIPROCAL LOCK

The space bar is used primarily to space the carriage between words and sentences. When operated, the space bar command mechanism:

- Engages the spacing cam clutch
- Controls the number of cycles to be performed by the spacing cam

COMMAND MECHANISM

The space bar operates the command mechanism for either of the following actions:

- Single carriage spacing
- Repeat carriage spacing

ASSEMBLY (REST POSITION)

The rest position of the space bar (7) is established by the rubber stop (A). The space bar is held in this position by the return springs attached to both sides of the space bar frame.

The space bar trip lever (6), through the action of the connecting spring, holds the starting lever (5) in position to prevent the flange (2) from releasing.

The spacing cam (4) is held at rest by the roller of the space bar escapement trip lever (3) which locates in one of the three dwells of the cam profile.

ACTIVATION

To activate the spacing cam, the starting lever (5) must release the flange (2) when the space bar is depressed.

The space bar (7) can be depressed two different amounts, depending on the spacing required:

- For single spacing, the extensions (C) will just contact the key lever locking bar (1).
- For repeat spacing, the extensions (C) will raise the key lever locking bar (1).

SINGLE-SPACE CYCLE

When the space bar (7) is depressed, the extensions (C) (only the left extension is illustrated) are raised and just contact the key lever locking bar (1). The arm (B) of the space bar frame rotates the space bar trip lever (6), which releases its hold on the starting lever (5), allowing the clutch to engage.

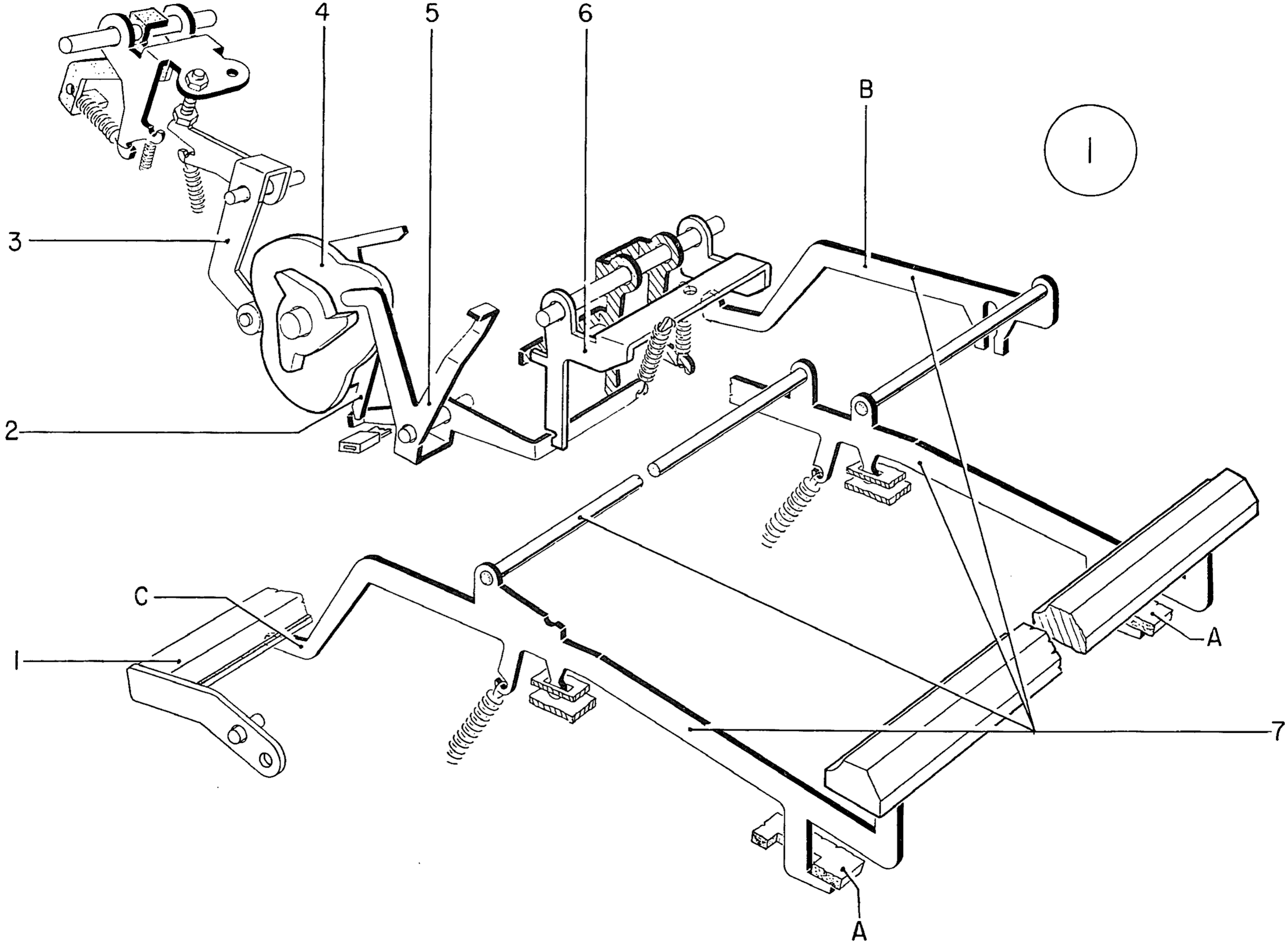

4
5
6
B
1
3
2
C
I
A
7
A

Figure 2 shows the command mechanism at rest.

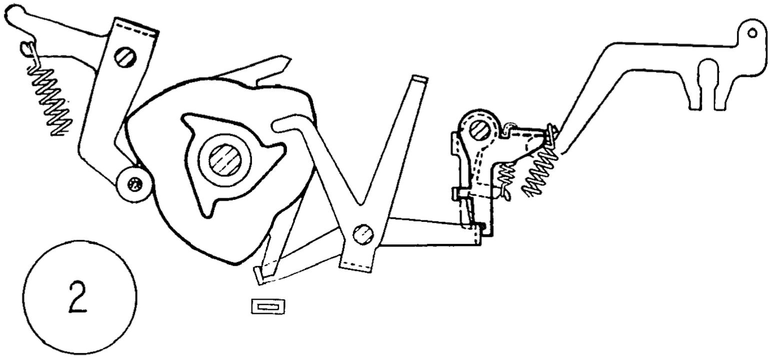
In figure 3 the space bar has been depressed to the single-space position, and the arm (B) rotated the trip lever (4). This movement caused the trip lever to release its hold on the starting lever (5). The starting lever, actuated by its spring, rotated until limited by the silencer (1). This movement released the flange (2) allowing the clutch to engage.

When the trip lever (4) was rotated, the trip lever latch (3), through the action of the connecting spring, also was rotated until stopped by the wing of the starting lever (5).

Figure 4 shows the cam profile (6) at the point of maximum restore of the starting lever (5), which is now in position to stop the flange (2). Since the space bar has been released at this time, the arm (B) allowed the trip lever (4) to return into position to hold the restored starting lever (5); consequently, the clutch will disengage at the completion of a single cycle.

Figure 5 also shows the cam profile (6) at the point of maximum restore of the starting lever (5). However, in this case the space bar is still being held depressed in the single-space position. The arm (B) of the space bar frame is still holding the trip lever (4) in a rotated position in which it cannot stop the starting lever (5). The starting lever, therefore, cannot stop the flange (2) and the clutch cannot be disengaged at the completion of a single cycle.

As a result of the trip lever (4) being held rotated, the connecting spring rotates the trip lever latch (3) into position to hold the restored starting lever (5). As the cam completes its rotation, the trip lever latch (3) will hold the starting lever, and cause the clutch to disengage at the completion of a single cycle. When the space bar is released, the arm (B) will allow the trip lever (4), together with the latch (3), to restore, and again hold the starting lever (5).



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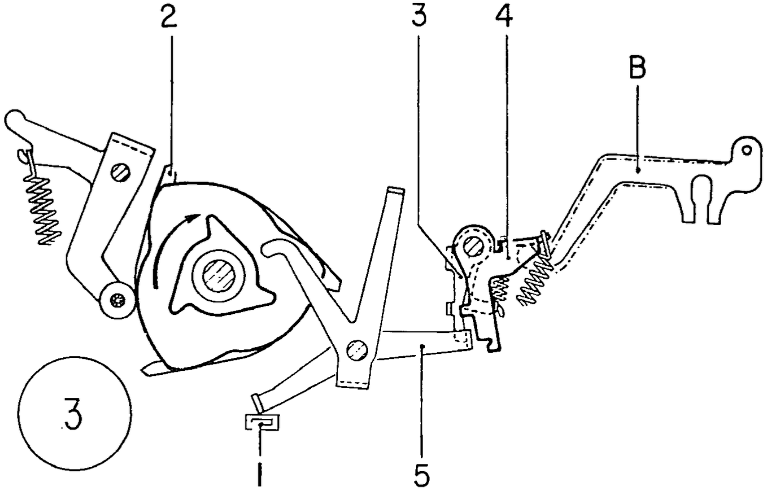

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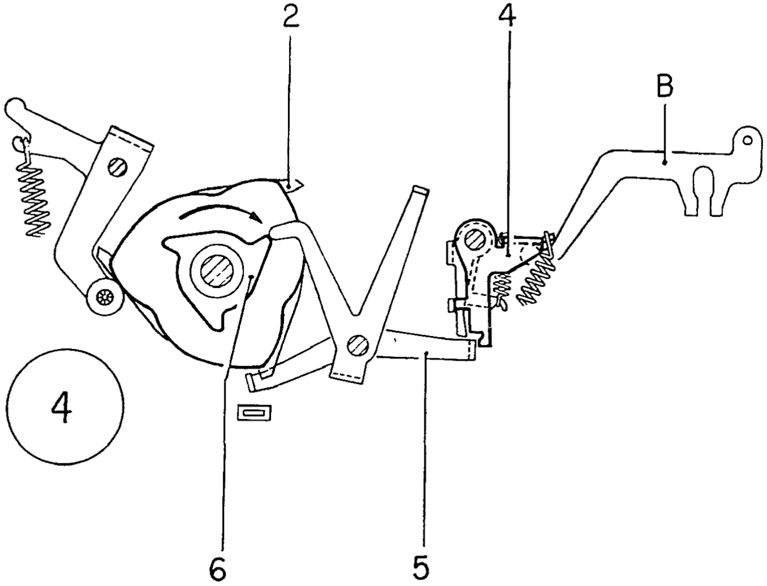

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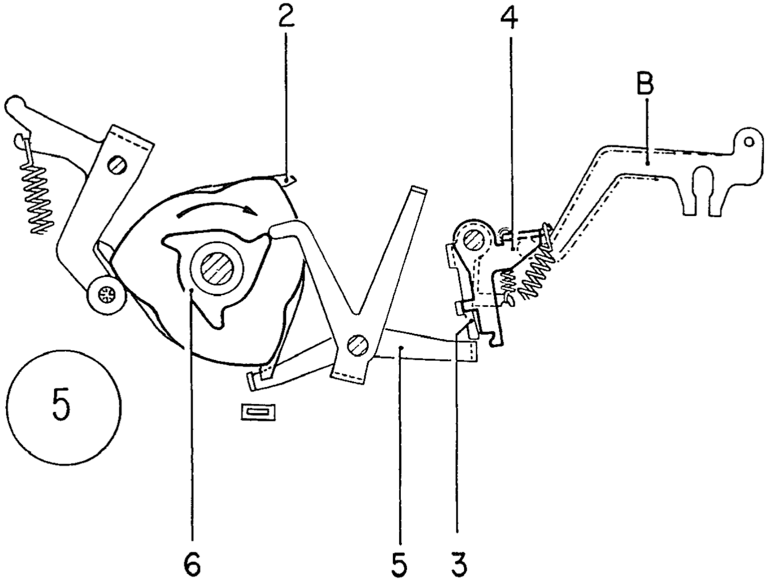

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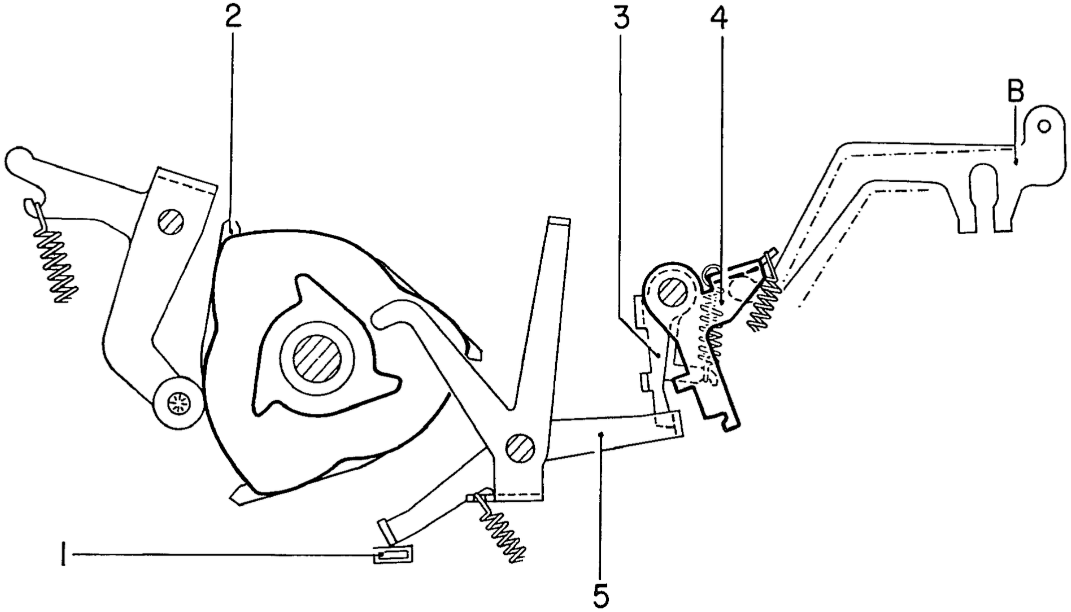
REPEAT SPACING CYCLES

In figure 6 the space bar has been fully depressed to the repeat position, and the arm (B) has, therefore, rotated the trip lever (4) farther than for a single cycle. The starting lever (5) has rotated until limited by the silencer (1), the flange (2) is released and the clutch is engaged.

Figure 7 shows the cam profile (6) at the point of maximum restore of the starting lever during the first cycle. As the starting lever was restored, it released its hold on the trip lever latch (3) which, actuated by its spring, has rotated until limited by the trip lever (4). With the trip lever latch (3) in this position, it cannot hold the starting lever (5) which, therefore, is free to release, and the cam can continue cycling as long as the space bar is held fully depressed.

During every spacing cycle, the spacing cam will rotate the escapement trip lever (7) actuating the escapement mechanism, allowing the carriage to space as described in Section 10 (Escapement), page 90.



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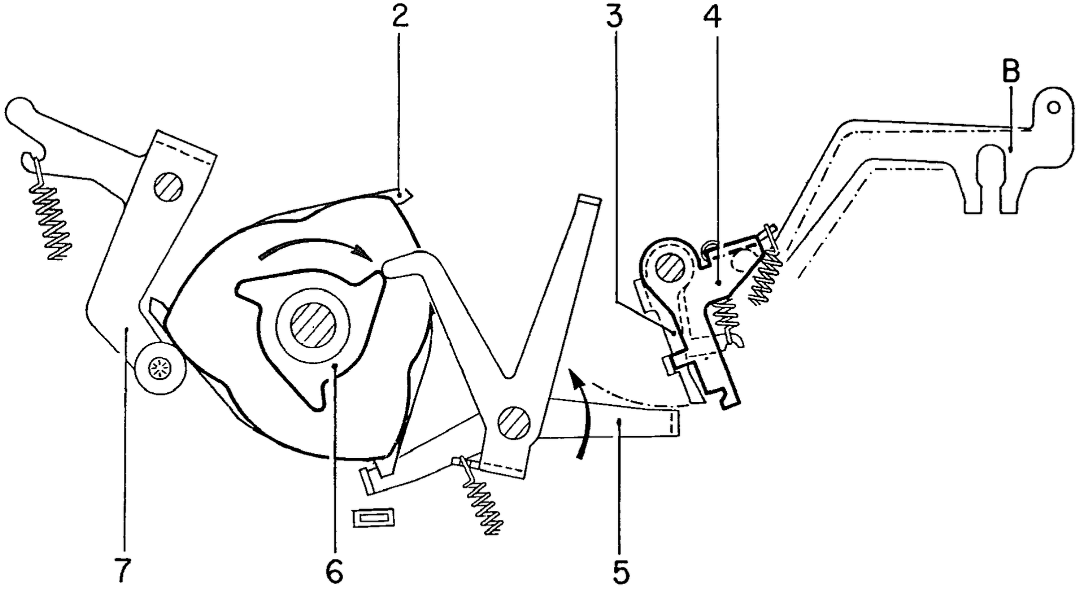

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RECIPROCAL LOCK BETWEEN PRINTING AND SPACING

The mechanisms which individually control the printing cam clutch and the spacing cam clutch also provide a reciprocal control (memory) between one another.

This control operates in the following manner:

- During a printing cycle, the space bar may be depressed, but the spacing cycle cannot take place until the printing cycle is completed.
- Similarly, during a spacing cycle, a character key may be depressed, but the printing cycle cannot start until the spacing cycle is completed.

It is therefore possible to always maintain the respective cycles in correct sequence. The resulting typing will have alternate spacing and character printing.

ASSEMBLY (REST POSITION)

Figure 8 shows, in rest position, the parts which provide the reciprocal control. In addition to the parts already described, the figure also illustrates the reciprocal control bridge (1) and shows its relationship (at rest) with the spacing cam starting lever (2).

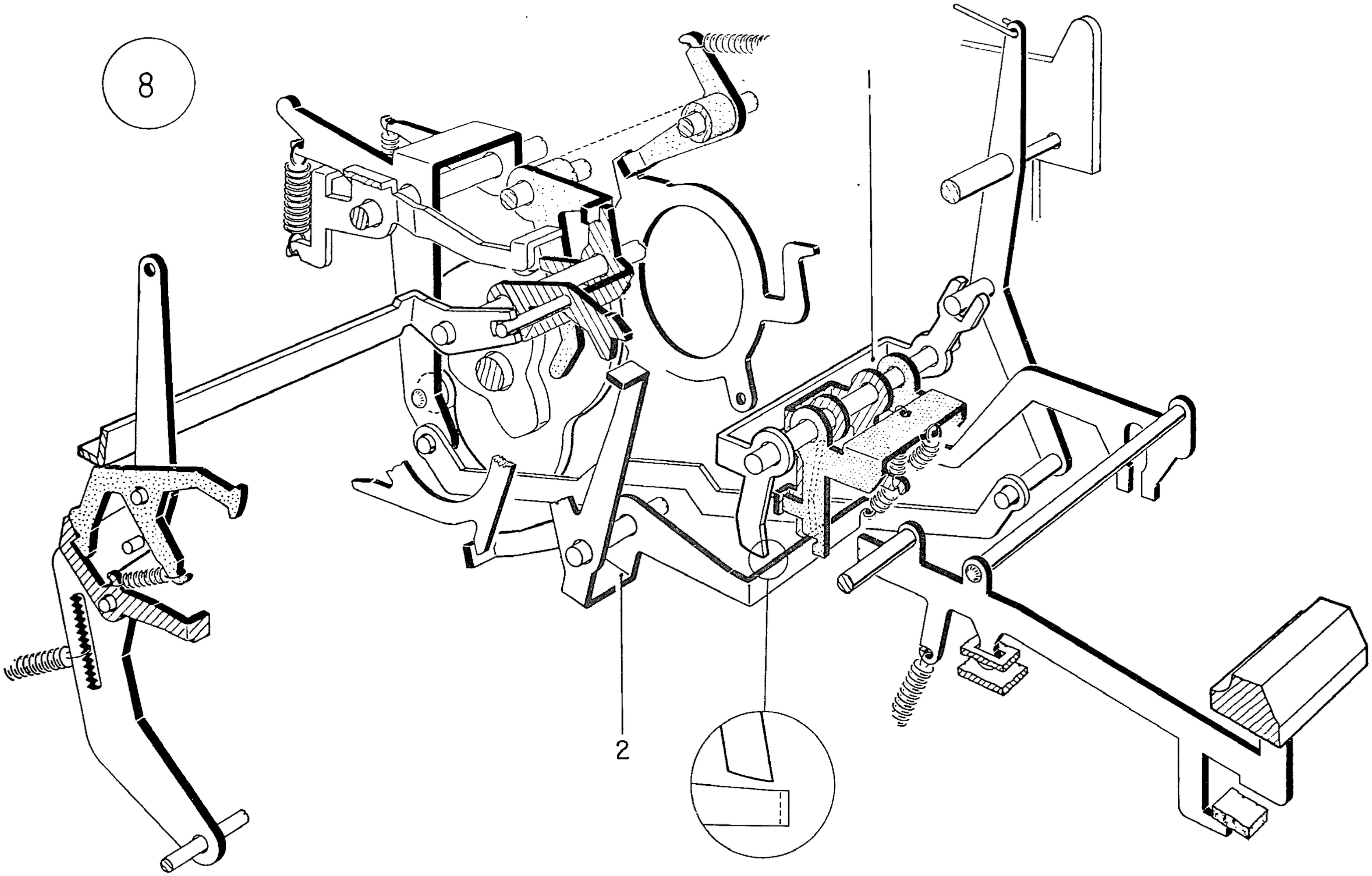

Figure 9 shows the reciprocal control mechanism at rest, with the print cam starting lever (4) and the space cam starting lever (1) holding their respective flanges (3 and 2). (The reciprocal control bridge (7) shown in the lower section of the drawings pivots on the same shaft as the spacing cam trip lever (6), as indicated by the dotted line.)

In figure 10 a character key has been depressed. The print cam activating bail extension (5) has rotated and released the starting lever (4), allowing the print cam clutch to engage. The arm (A) of the extension (5) has moved directly into the path of the spacing cam starting lever (1).

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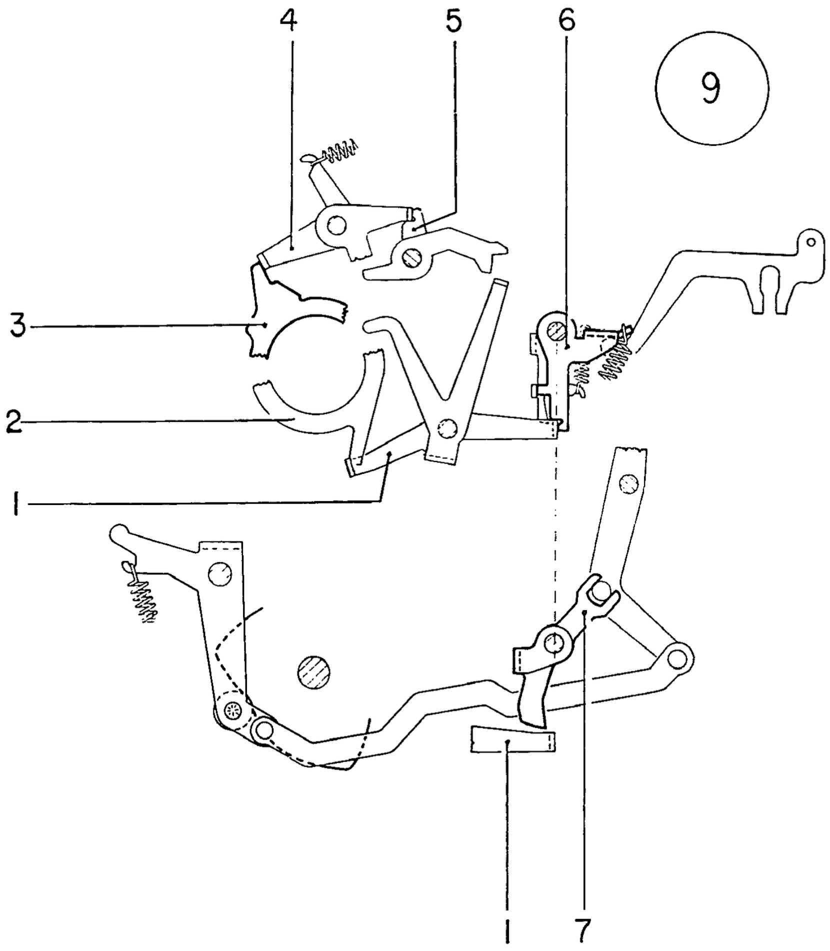

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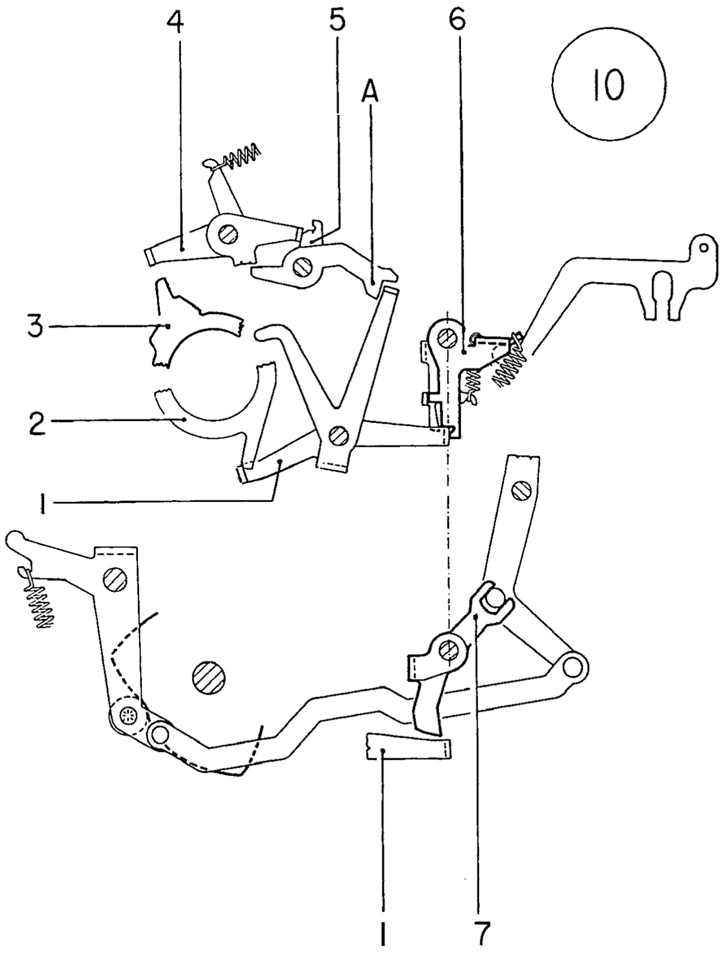

In figure 11 the space bar has been depressed immediately after the printing cycle has started. The arm (B) of the space bar frame has rotated the spacing cam trip lever (6), releasing the spacing cam starting lever (1). The starting lever, after a slight movement, is held by the arm (A) of the print cam activating bail extension (5). The rotation of the starting lever (1) is not enough to release the flange (2).

During the printing cycle, the ribbon feed frame (8) is rotated. Figure 12 shows that the movement of the frame (8) has rotated the reciprocal control bridge (7) so that it is directly above the spacing cam starting lever (1). As the printing cycle continues, the print cam activating bail extension (5) is restored. This caused the arm (A) to release its hold on the spacing cam starting lever (1), which rotated slightly until limited by the reciprocal control bridge (7). The rotation of the starting lever was still not enough to release the flange (2), but was enough to prevent the extension (5) from being released at this time by the depression of another character key.

In figure 13 the printing cycle is completed. The ribbon feed frame (8) has restored to rest, and has rotated the lower portion of the reciprocal control bridge (7) rearward. This movement of the bridge caused it to release its hold of the spacing cam starting lever (1). The starting lever, now released, has completed its rotation and released the flange (2). The spacing cam clutch is therefore allowed to engage and the spacing cycle takes place.

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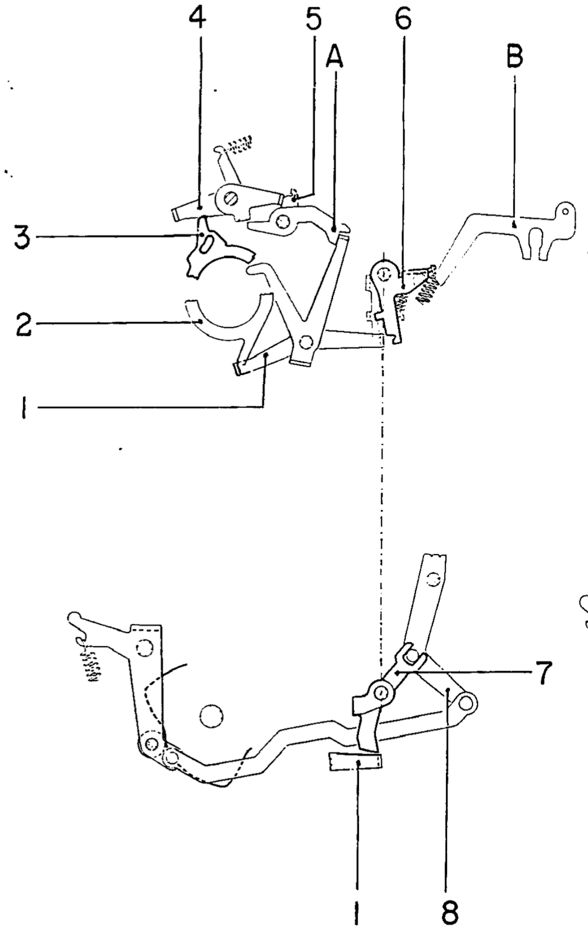

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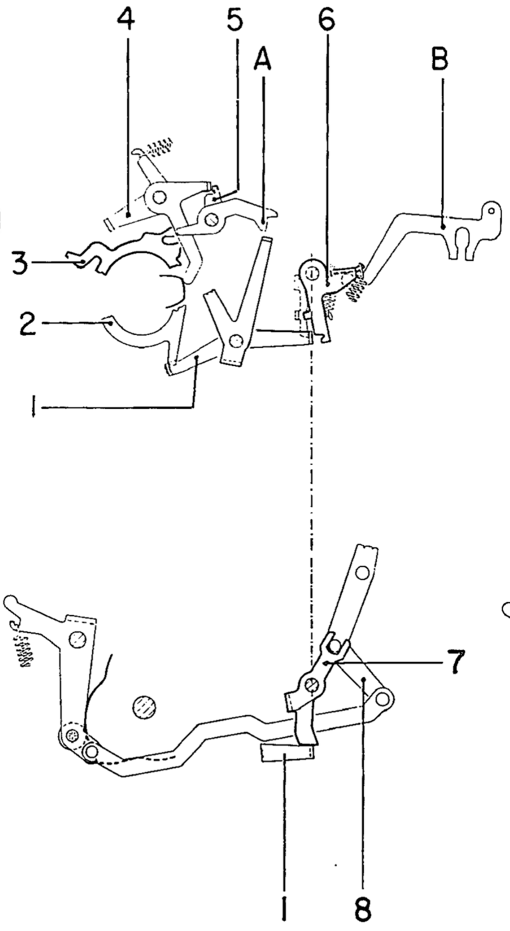

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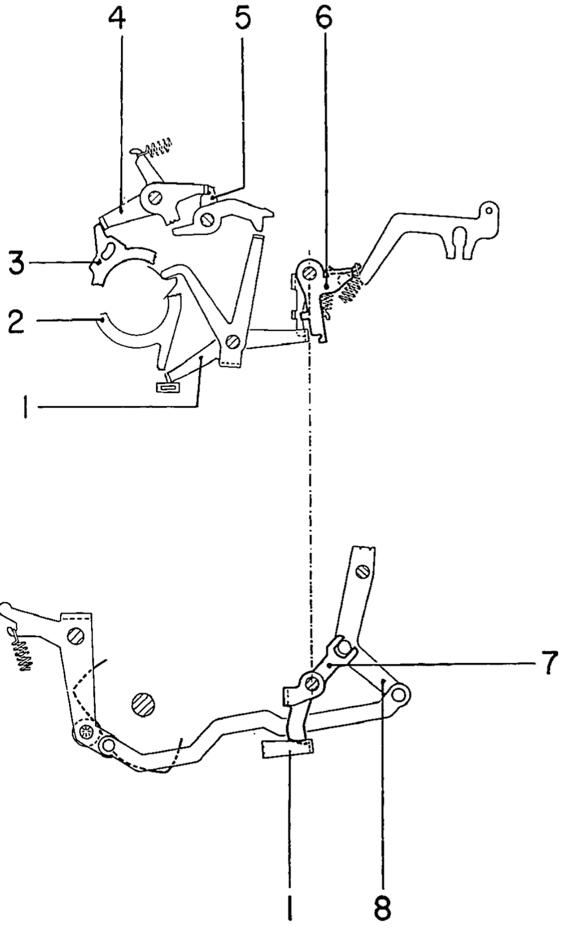
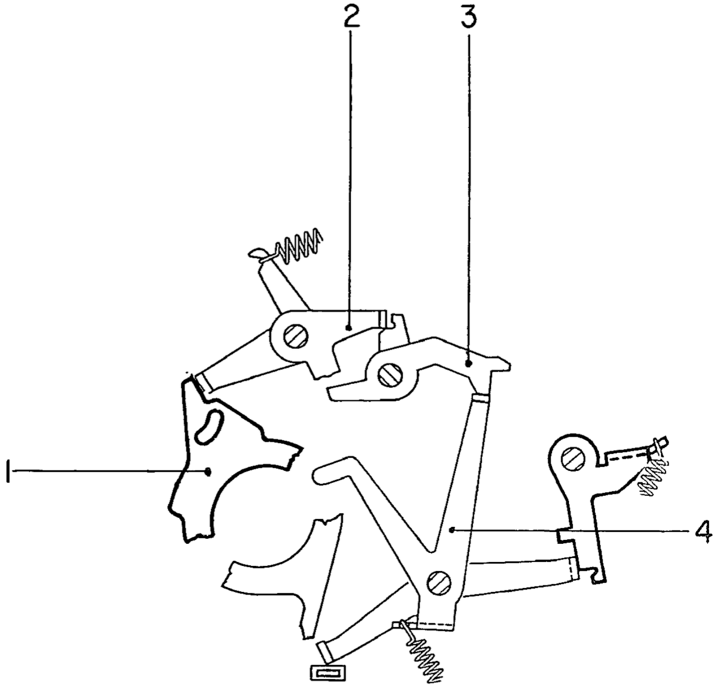


In figure 14 a spacing cycle has been started, followed immediately by the depression of a character key. The extension (3) has rotated slightly until stopped by the released spacing cam starting lever (4). The slight rotation of the extension is not enough to allow the print cam starting lever (2) to move and release the flange (1).

The depression of the character key has released the pull link (5), but the slight movement was not enough to position it over the type-action bail (6), as shown in figure 15.

Towards the end of the spacing cycle, the spacing cam starting lever (4) is restored. This allows the spring (7) to complete the rotation of the pull link (5), and allows the print cam starting lever (2) to rotate and release its hold on the flange (1).



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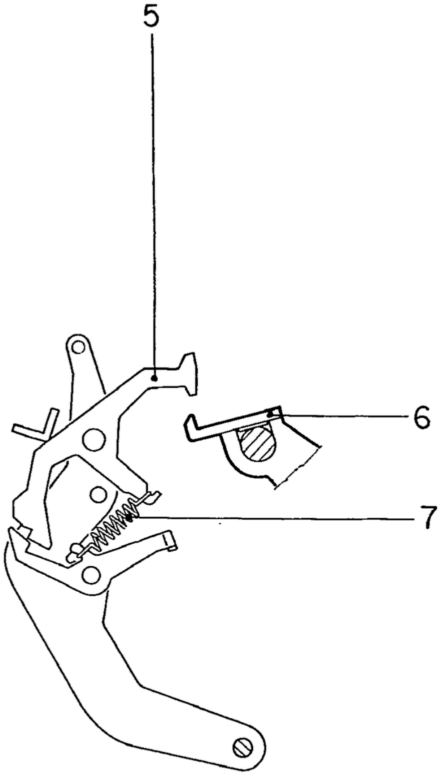


15

ADJUSTMENTS

ESCAPEMENT DOG DISENGAGEMENT ADJUSTMENT

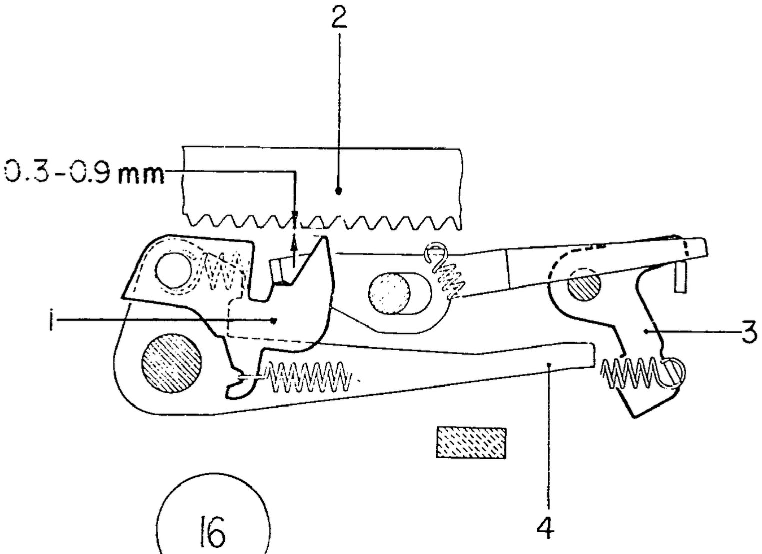
During a spacing cycle, the escapement dog must release from the rack with a clearance of 0.3 to 0.9 mm to allow the carriage to space properly.

To check and adjust the release clearance of the dog, proceed as follows:

- Disconnect the power cord from the machine.
- Place the machine on its back.
- The escapement dog can be seen through the access hole in the carriage fixed rail casting located directly above the "service unit."
- To make it possible to observe the release clearance, the advance crank (4) must be prevented from rotating when the latch (3) releases the crank (refer to figure 16). This is accomplished by depressing the back-space key and the space bar, simultaneously.

  Note. Temporarily form the finger A to the position A1, as shown in figure 18, so that it does not touch the finger (B) of the reset frame shaft during rotation. (This is necessary since the "reverse underscoring" feature on the Editor 4 prevents the escapement trip from occurring during a backspace cycle.)

- Hold the carriage, and slowly turn the power shaft until the dog (1) reaches its maximum disengagement from the rack, which should be 0.3 to 0.9 mm (figure 16).
- To adjust, regulate the space bar escapement trip adjusting screw (5, figure 17), as required.
- Readjust the finger A1 back to the position A. (Refer to the "escapement trip exclusion adjustment" in Section 20, page 228.)



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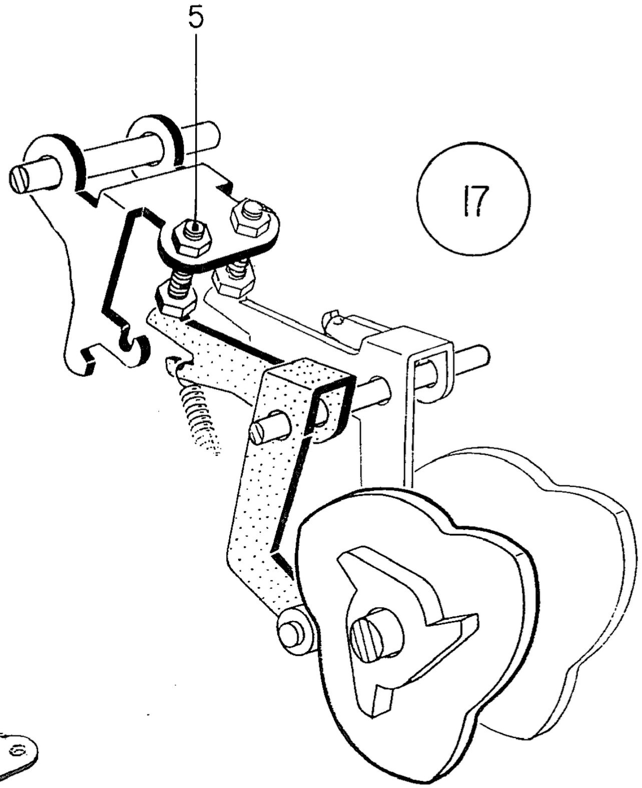

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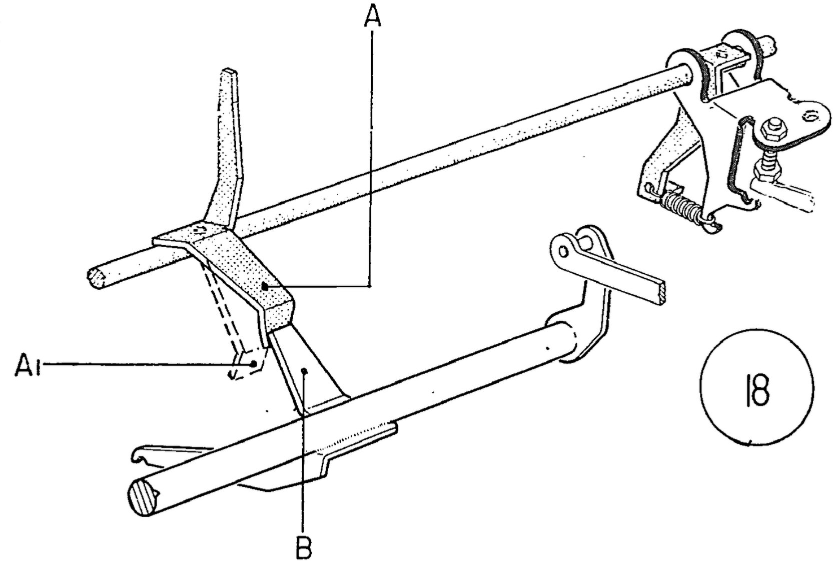


18

SPACING CAM CLUTCH RELEASE ADJUSTMENT

The space bar can assume any one of the following three positions:

- Rest position
- Single-space position (partial depression)
- Repeat-space position (full depression)

In the rest position, the spacing cam clutch must be disengaged.

In the single-space position, the clutch must engage, and then disengage after one cycle, regardless of whether the space bar is held depressed at the completion of the cycle or not.

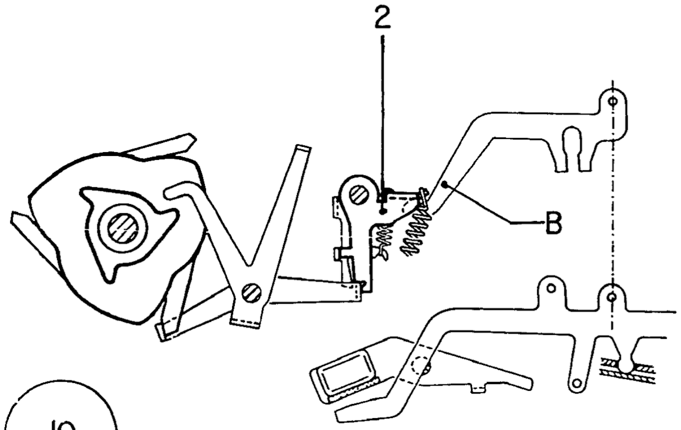
In the repeat-space position, the clutch must engage and remain engaged as long as the space bar is held depressed in this position.

These positions are determined by the angular position of the arm (B) of the space bar frame, which controls the position of the trip lever (2).

Slowly depress the space bar until the trip lever (2) releases the starting lever (5) with a very slight clearance as indicated by (A), figure 20. In this position the space bar frame (3) should clear the key lever locking bar (4) by 0.2 mm.

To adjust:

- Open or close the U-shaped opening in the arm (B) of the space bar frame.
- After the adjustment, perform the following check:
  - Depress the space bar until the space bar frame (3) contacts the key lever locking bar (4). Check that in this position the trip lever latch (6) is squarely over the starting lever (5), as shown in figure 21.
  - Fully depress the space bar to the repeat position, and check that the trip lever (2) and the trip lever latch (6) are both forward and clear of the starting lever (5), as shown in figure 22.
- If the above conditions are not satisfied, readjust the U-shaped opening and check again.



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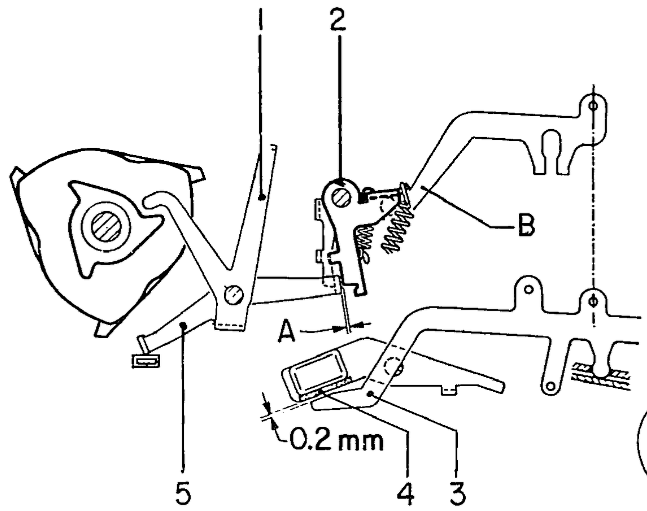

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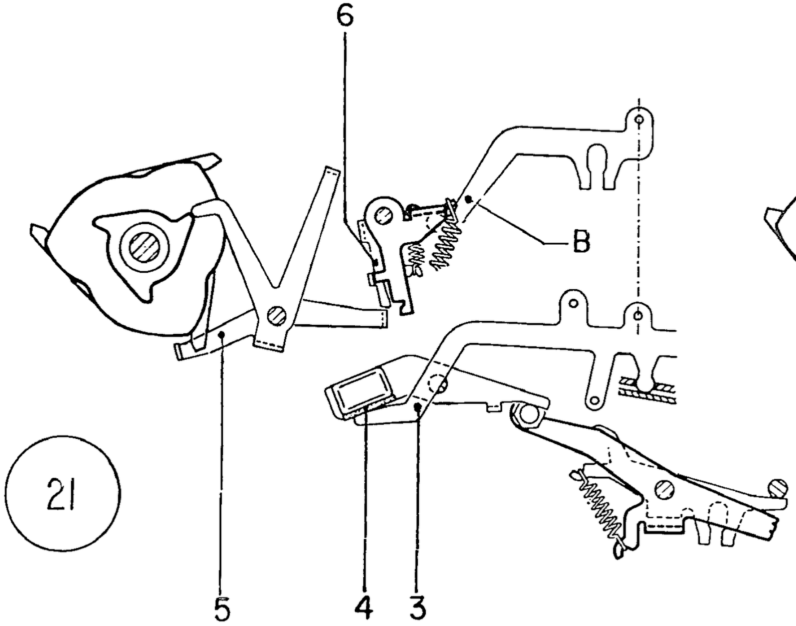

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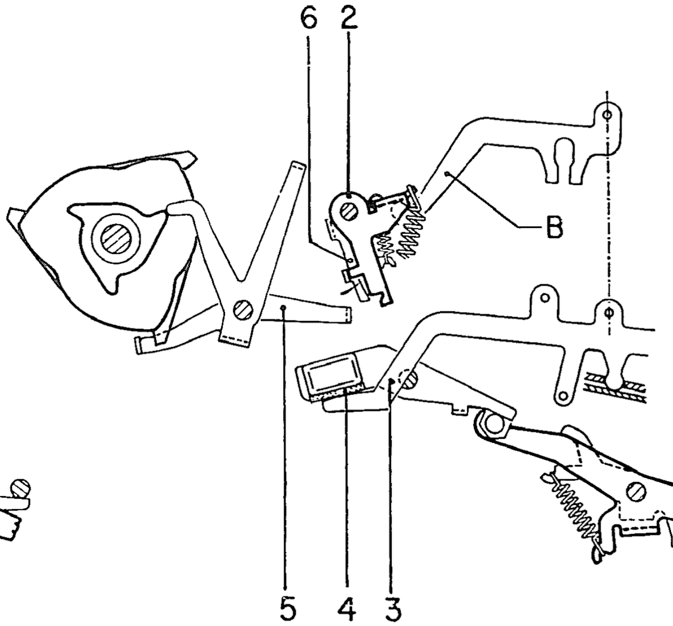
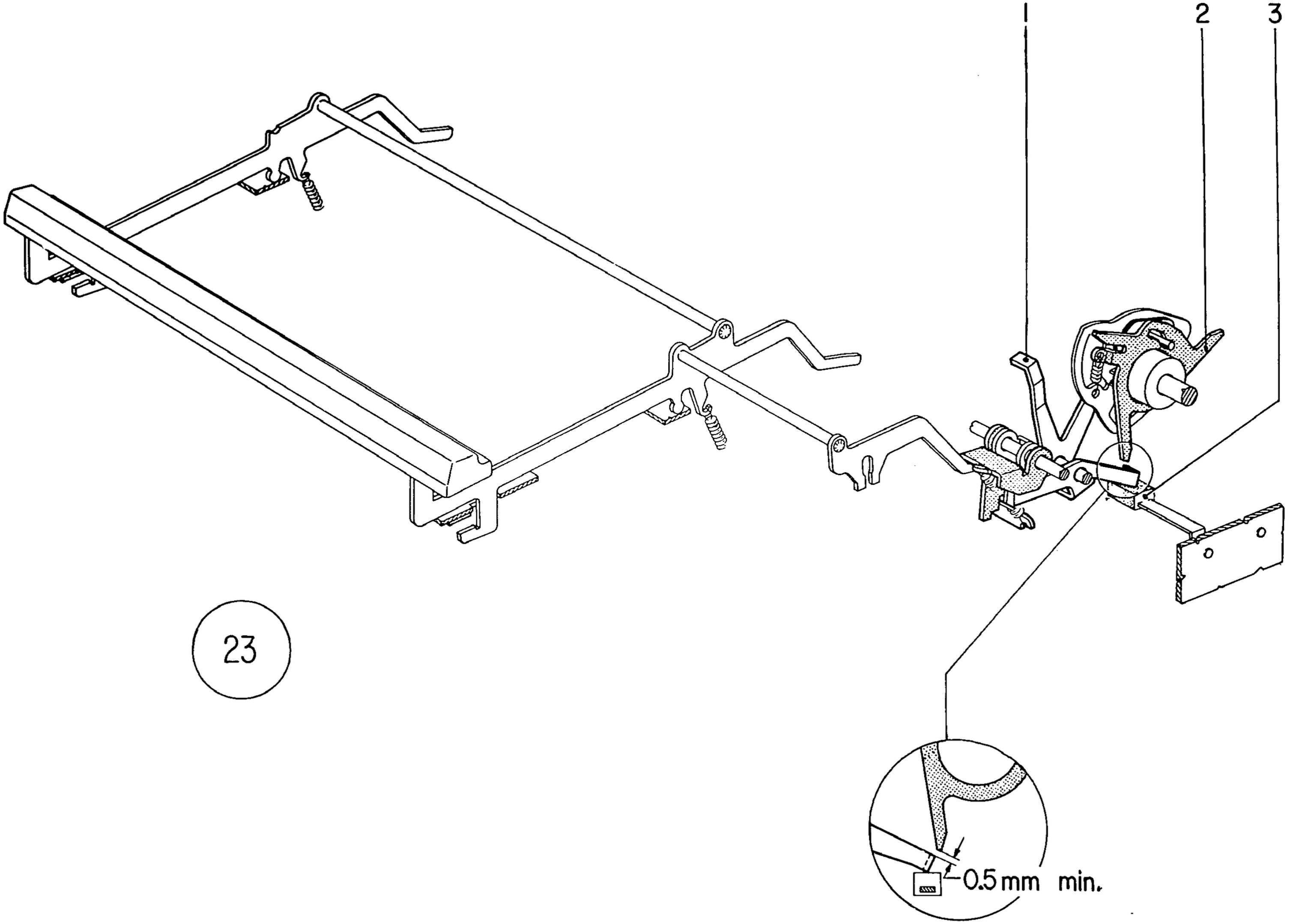


22

SPACING CAM STARTING LEVER SILENCER ADJUSTMENT

With the machine unplugged, depress and release the space bar. With the starting lever (1) resting on the silencer (3), there must be 0.5 mm clearance between the starting lever (1) and the flange (2).

To adjust the clearance, form the arm of the silencer (3), as required.


0.5 mm min.

SECTION 16

TYPING MEMORY

INTRODUCTION TO TYPING MEMORY

There are many common words in which two consecutive characters can be typed extremely fast by most typists. The "TH" in the word THE is such a combination of letters. On most typewriters the rapid typing of these characters may result in the letters crowding or the type bars jamming. To eliminate these problems, the Editor 4 incorporates a unique memory feature which ensures that the characters print in correct sequence.

ACTIVATION

Figure 1 illustrates the relationship between the type-action bail and two pull links released in rapid succession.

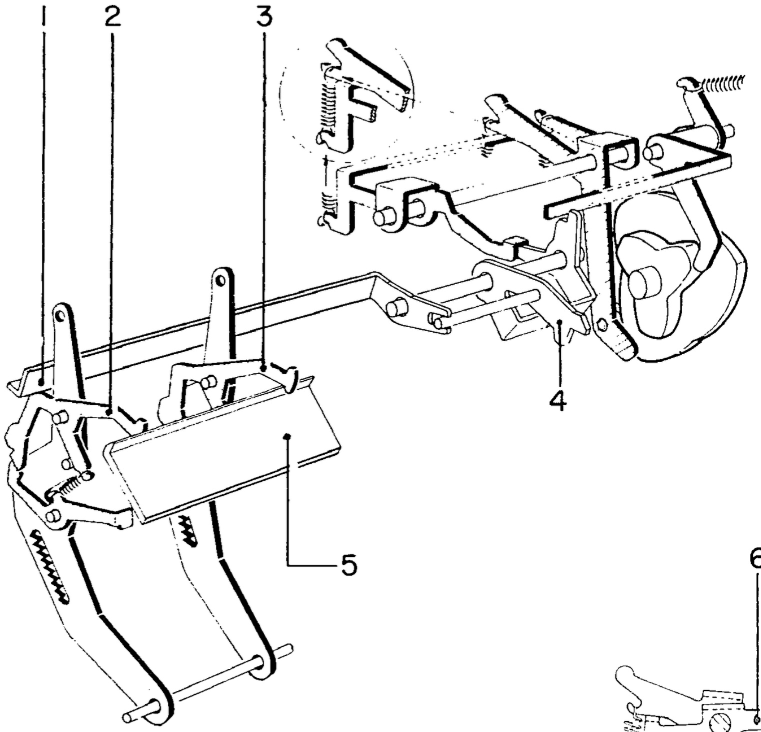
The first pull link (3) is already being pulled by the type-action bail (5). The second pull link (2), which was released too late to be engaged by the type-action bail, drops behind the type-action bail and holds the print cam activating bail (1) in a raised position.

Figure 2 illustrates the maximum restoring of the starting lever (7) during the first print cycle. The print cam activating bail restore bridge (6) has just contacted the extension (4) of the print cam activating bail (1).

In figure 3 the first print cycle is nearly completed, and the following conditions are illustrated:

- The type-action escapement trip lever (8) is at the point of maximum rotation.
- The coupling spring (10) between the trip lever (8) and the restore bridge (6) has stretched slightly.
- The extension (4) has not been restored by the restore bridge (6) since the tension of the spring (9) is greater than that of the coupling spring (10).

As a result of the above, the starting lever (7) does not disengage the print cam clutch, the cam continues to turn, thus allowing the character in memory to print.



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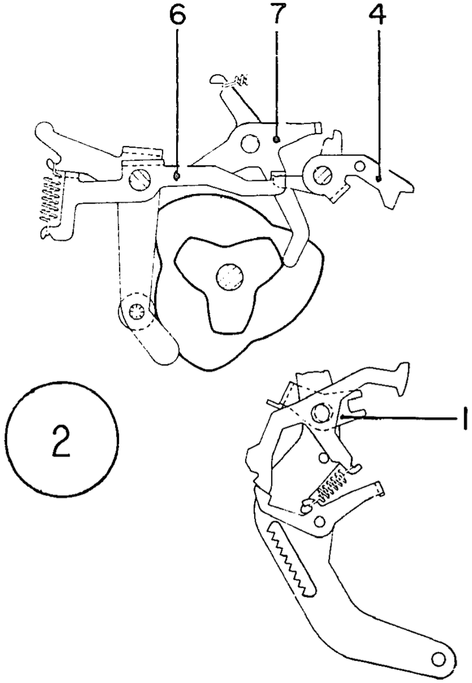

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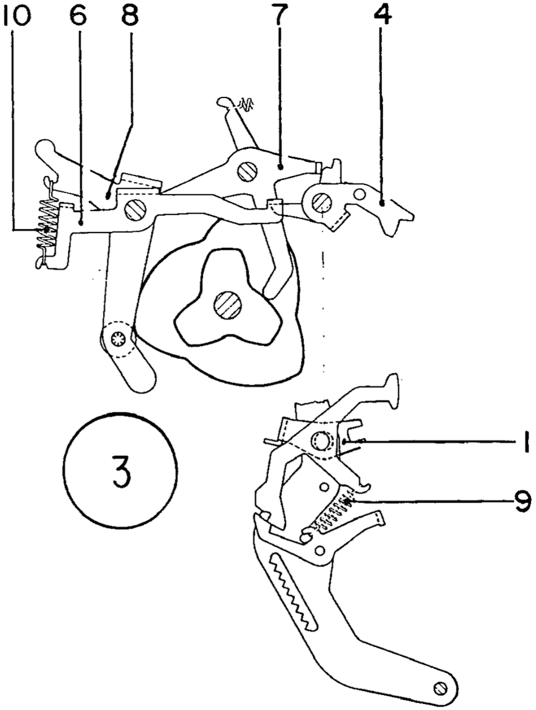


③

SECTION 17

KEYBOARD DEACTIVATION

(INPUT CONTROL AND ANTI-JAM)

INTRODUCTION TO KEYBOARD DEACTIVATION

On most typewriters, when two character keys are depressed simultaneously, the type bars could collide as they approach the platen, and possibly jam at the type guide.

With the Editor 4, when two or more character keys are depressed at the same time, the machine automatically performs a non-print cycle with the following results:

- The carriage advances one space.
- The type bars involved are prevented from rising high enough to collide or jam. (For specific exception, refer to Note in check on page 180.) This action is controlled through an "anti-jam" mechanism.
- The keyboard deactivates through an "input control" mechanism.

The function of the input control mechanism is to prevent any further release of the print cam starting lever as a result of two keys being depressed simultaneously, thereby, accomplishing our objective, keyboard deactivation.

A function of the anti-jam mechanism is to ensure that the input control mechanism will function properly during double-key depression.

To resume typing, the back space key should be depressed. This causes:

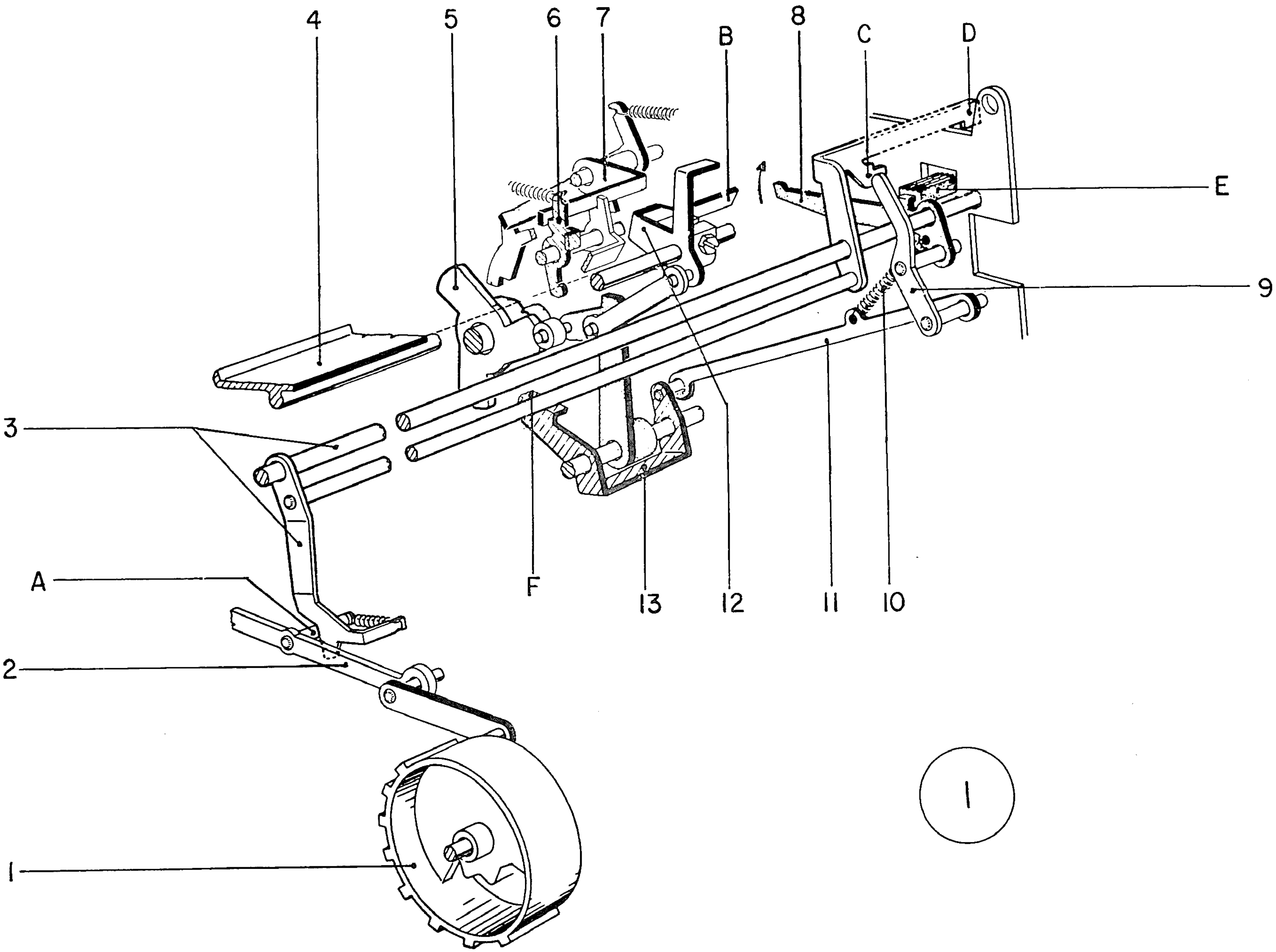
- The carriage to back space to the point at which the printing was interrupted.
- The input control mechanism to release, thereby reactivating the keyboard.

INPUT CONTROL AND ANTI-JAM MECHANISM

ASSEMBLY (REST POSITION)

Figure 1 illustrates the parts, at rest position, which limit the travel of the type bars and control deactivation of the keyboard during double-key depression.

- The step of the input control latch (6) is resting against the side of the wing of the starting lever (7), under spring tension.
- The anti-jam lever (8) is at rest with its rubber stop (E) resting on the lower edge of the cutout in the side plate, through the tension of spring (10).
- The crank (12) with its wing (B) is secured to the shaft of the type-action bail (4).
- The angular rest position of the anti-jam control frame (3) is established by its wing (D) resting against the side plate when the copies control dial (1) is in the 1-4 position. When the dial is set at 5-8, 9-12 or 13+, the rest position of the control frame (3) is established by the pin (A) in the link (2).
- The lever (9), under the tension of spring (10), rests against the wing (C) of the control frame, and, through the link (11), angularly positions the extension (F) of bridge (13) in the path of the print cam (5).


B
C
D
E
A
F

ACTIVATION (GENERAL)

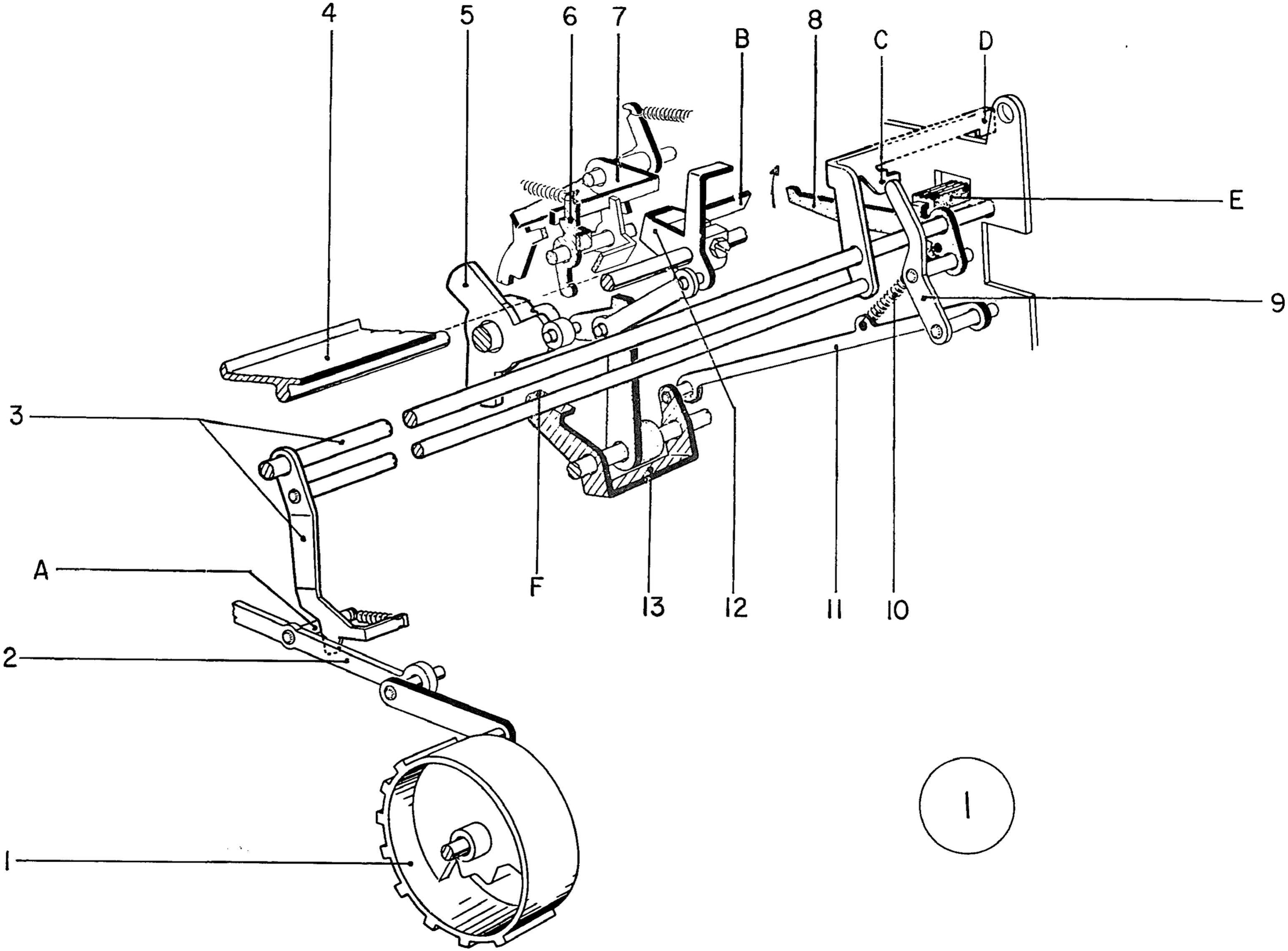
The anti-jam mechanism operates on a time relationship basis.

The speed at which the type-action bail rotates varies according to the four different positions of the copies control dial and the reaction of the impression control springs. When one key is depressed, the type-action bail (4) rotates at a certain speed. However, when two keys are depressed simultaneously, the rotational speed of the bail (4) is considerably slower.

During every printing cycle the anti-jam lever (8) rotates up and attempts to stop the rotation of the crank (12). This action is controlled by a cam lobe (5) contacting the wing (F) and rotating the bridge (13). The link (11) moves rearward and, through the spring (10), the anti-jam lever rotates up as indicated by the arrow.

- If the crank (12) rotates faster than the anti-jam lever (8), the wing (B) will not be stopped by the anti-jam lever and the bail (4) will rotate fully. (Single-key depression.)

- If the rotational speed of the crank (12) is slower than the anti-jam lever (8), the latter will rise in time to intercept the wing (B), preventing the full rotation of the crank and, in turn, the bail (4). (Double-key depression.)



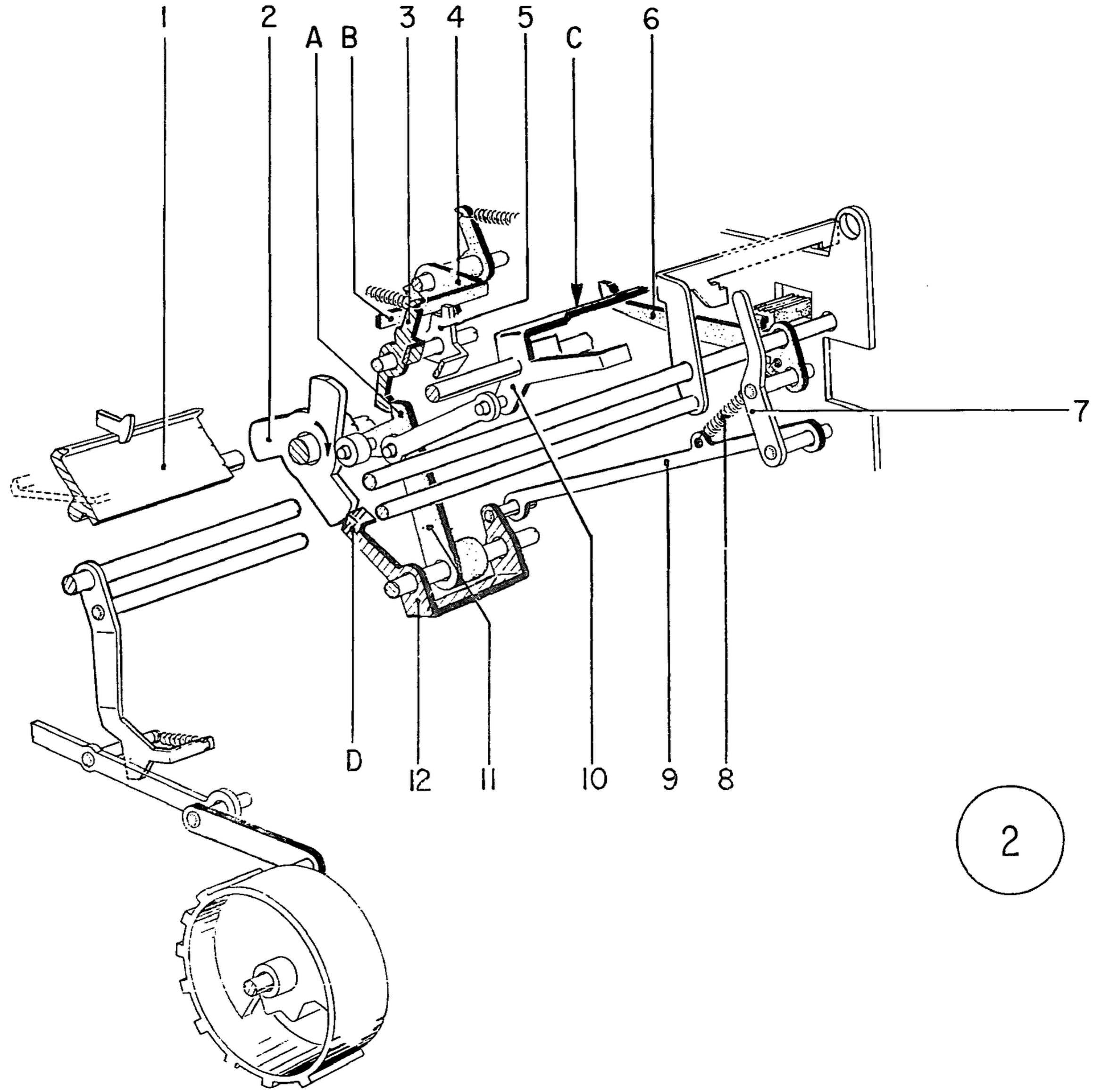
①

ACTIVATION (SINGLE-KEY DEPRESSION)

During a normal print cycle initiated by the depression of one key, the type-action bail (1) rotates quickly, consequently, the wing (C) of the crank (10) is not intercepted by the anti-jam lever (6). The type-action bail (1) together with the cam follower (11) were able to rotate fully, permitting the upper extension (A) of the cam follower to contact and rotate the input control latch (3). In this position the input control latch cannot interfere with the wing (B) of the starting lever (4) as it restores to its normal position on the step of the print cam activating bail extension (5). The machine, therefore, is in condition for the next print cycle.

During the print cycle, the anti-jam lever (6) eventually rotated upward through the action of the bridge (12). The upward movement of the anti-jam lever stopped when it contacted the underneath portion of the wing (C), causing the spring (8) to yield.

When the lobe of the cam (2) passes by the arm (D), the bridge (12) together with the link (9) and lever (7) return to rest position through the tension of spring (8).



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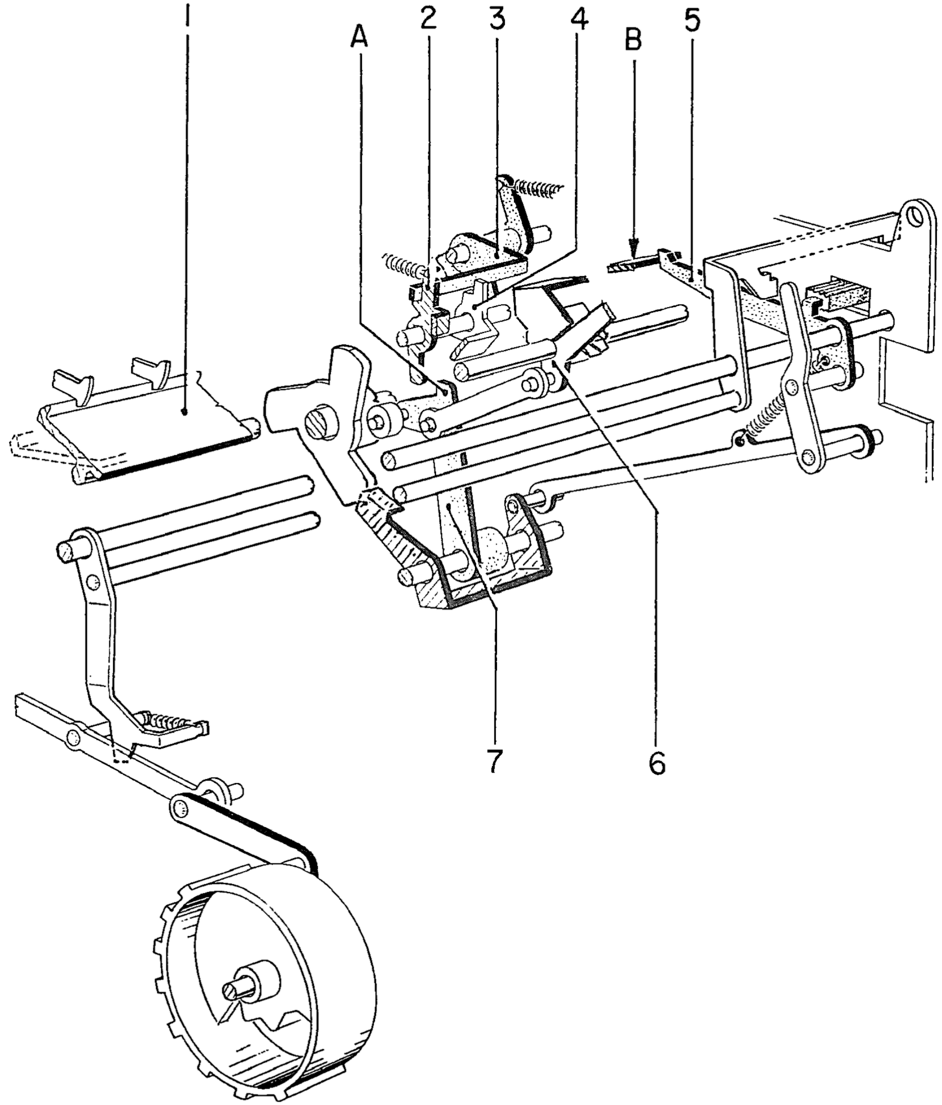
ACTIVATION (DOUBLE-KEY DEPRESSION)

During a print cycle initiated by the depression of two keys, the type-action bail (1) rotates at a slower speed, consequently, the wing (B) of the crank (6) is intercepted by the anti-jam lever (5). The type-action bail (1) and the cam follower (7) are unable to fully rotate. Therefore, the associated type bars are stopped in their upward travel, and the extension (A) of the cam follower (7) does not contact the input control latch (2).

When the starting lever (3) restored, it came to rest on the step of the input control latch (2) rather than on the step of the print cam activating bail extension (4). As a result, the starting lever is no longer under the control of the activating bail extension (4), and subsequent key lever depression cannot start a print cycle; the keyboard is thereby deactivated.

> Note. Keyboard reactivation is described in Section 18.



3

As previously described, the proper operation of the anti-jam mechanism depends on:

- The rotational speed of the type-action bail.
- The timing in which the anti-jam lever is activated by the cam profile.

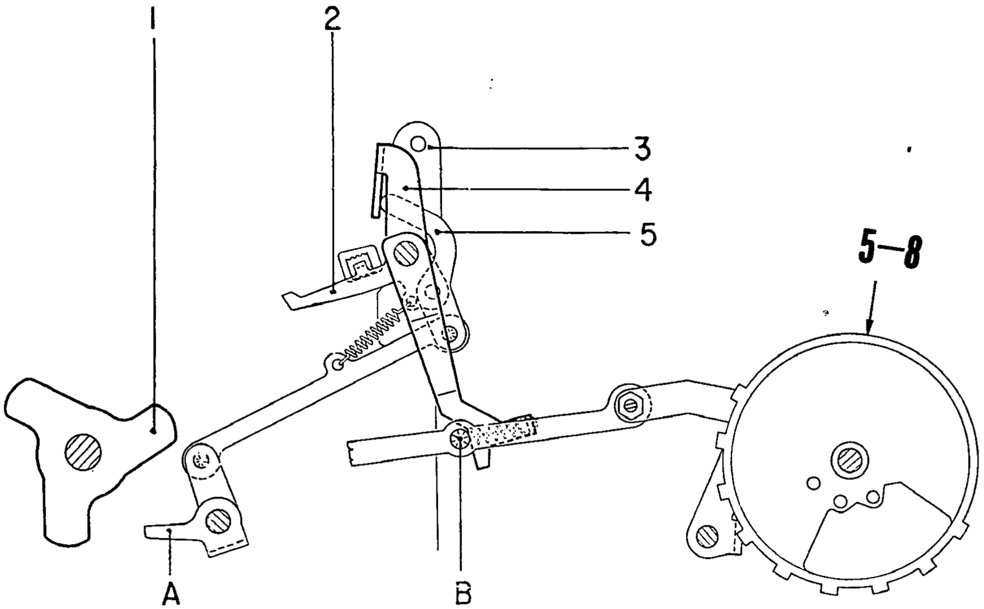
Since the rotational speed of the type-action bail varies according to the setting of the copies control dial, it is obvious that the movement of the anti-jam lever (2) is directly related to the settings of the copies control dial.

Figure 4 illustrates the rest position of the anti-jam mechanism with the copies control dial at the 5-8 setting. In this position the arm (A) of the bridge is located a given distance from a lobe on the print cam (1). The parts of this mechanism assume practically the same position when the dial is at the 1-4 setting. It should be remembered that in the 1-4 setting the wing (D, figure 1 of this section) being against the side plate of the machine established the rest position of the frame (4). In the 5-8 setting the stud (B) lightly contacts the frame (4) and positions it so the wing (D, figure 1) just clears the side plate of the machine.

Figure 5 shows the position of the anti-jam mechanism with the copies control dial at the 13+ setting.

In this position the type-action bail rotates at a greater speed, and the anti-jam lever, therefore, must respond accordingly. This is done by the arm (A) of the bridge being positioned nearer to a lobe on the print cam by means of the link (6), lever (5), frame (4) and pin (B). The arm (A) moved from the dotted-outline position (1-4 and 5-8) to the 13+ position. The arm moves approximately half the distance when the dial is at the 9-12 setting.

In the above manner the action of the anti-jam lever is timed with the variable rotational speeds of the type-action bail.



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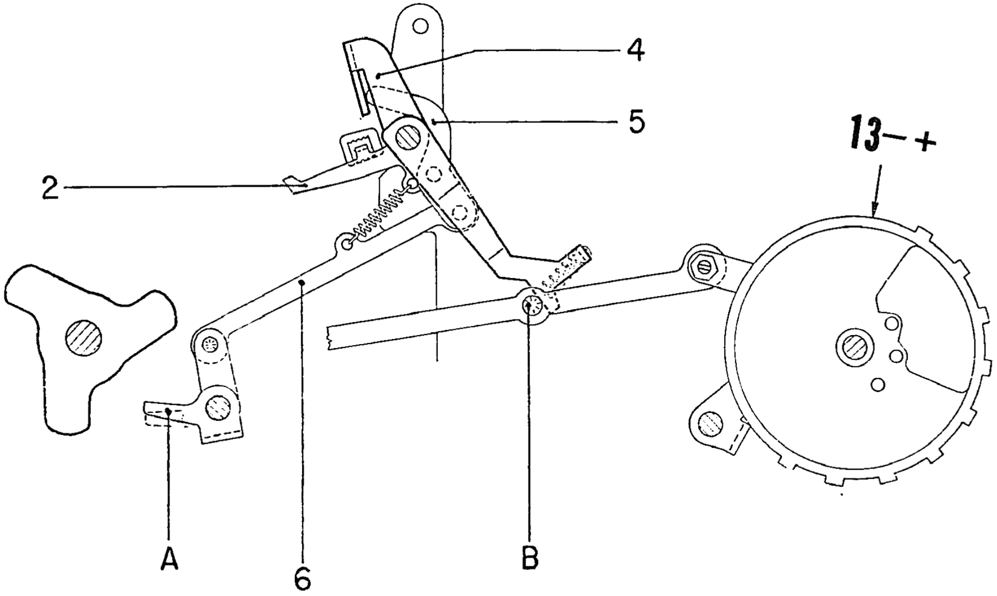

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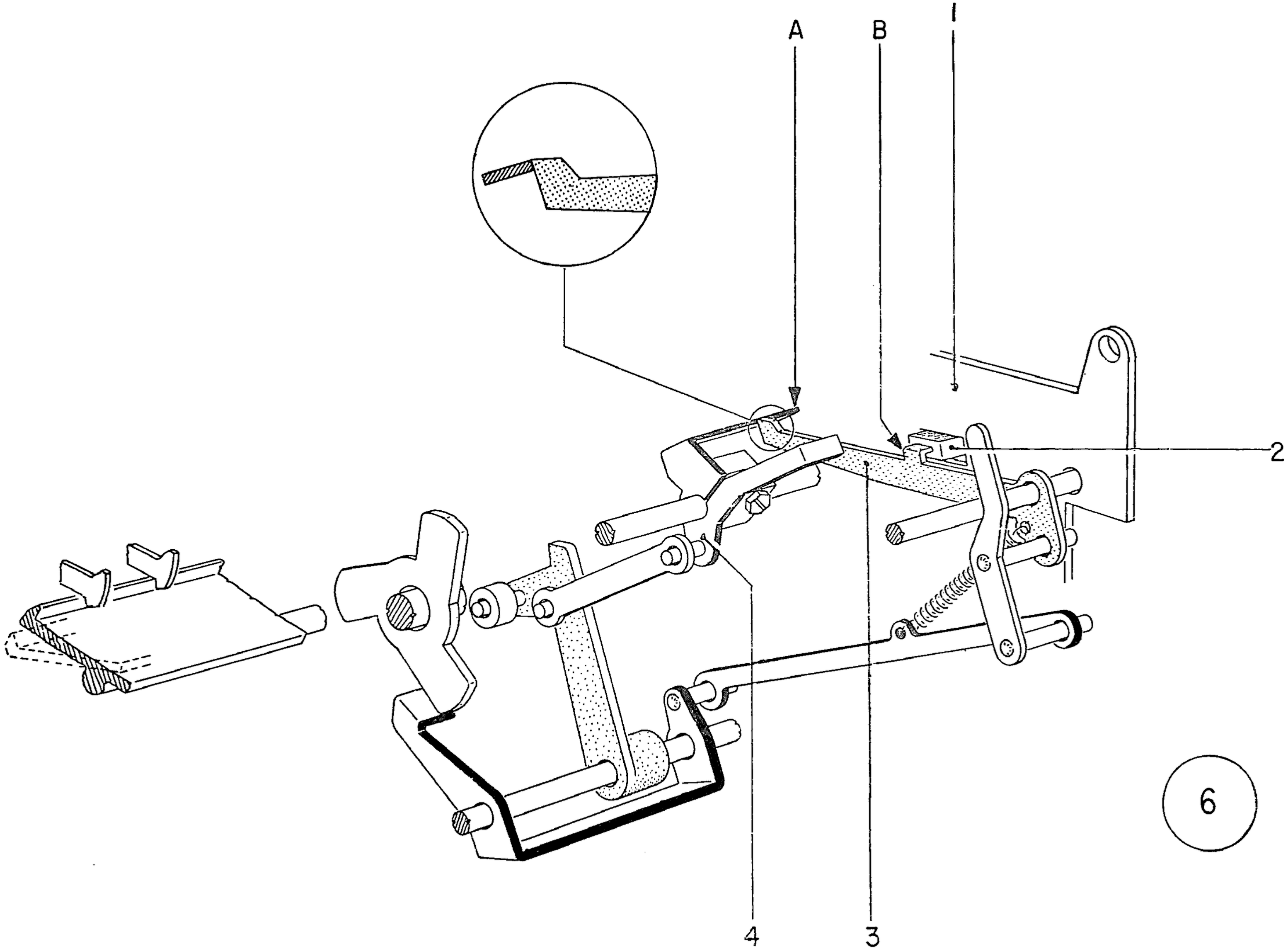
ANTI-JAM LEVER ACTIVE POSITION ADJUSTMENT

During a print cycle initiated by the depression of two keys, simultaneously, the anti-jam lever (3) must rise to positively intercept the wing (A) of the crank (4).

To check for the above condition, and to ensure that, with the anti-jam lever at rest, the crank (4) can fully rotate, perform the following:

- Manually raise the anti-jam lever (3) so the rubber pad (2) limits against the upper edge of the cutout in the side plate (1).
- Depress a character key and slowly turn the power shaft. The wing (A) of the crank (4) must contact the end of the anti-jam lever (3) with a full thickness of stock hold as indicated in the detail inset.

To adjust, form the anti-jam lever rubber pad extension (B) as required.



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ANTI-JAM CONTROL FRAME (REST POSITION) ADJUSTMENT

With the copies control dial in the 1-4 position, the wing (B) of the anti-jam control frame (2) must rest against the side plate of the machine as at C.

To adjust:

- Form the wing (B) as required.
- Check that the wing (B) of the control frame (2) just clears the side plate of the machine when the dial is set at the 5-8 copies position.

TIMING OF ANTI-JAM LEVER WITH TYPE-ACTION BAIL

During a normal print cycle, the type-action bail must rotate fully. When two keys are depressed simultaneously, the type-action bail must only rotate partially.

Check for the above conditions, as follows:

- With the segment in lower case and the copies control dial set at 13+, fully depress a repeat character key. The keyboard must not deactivate, even when pushing slightly rearward on wing (A).
- Repeat the step above with each of the other character keys.
- Shift the segment to upper case (dial at 13+) and check that the keyboard deactivates when two keys are depressed simultaneously.

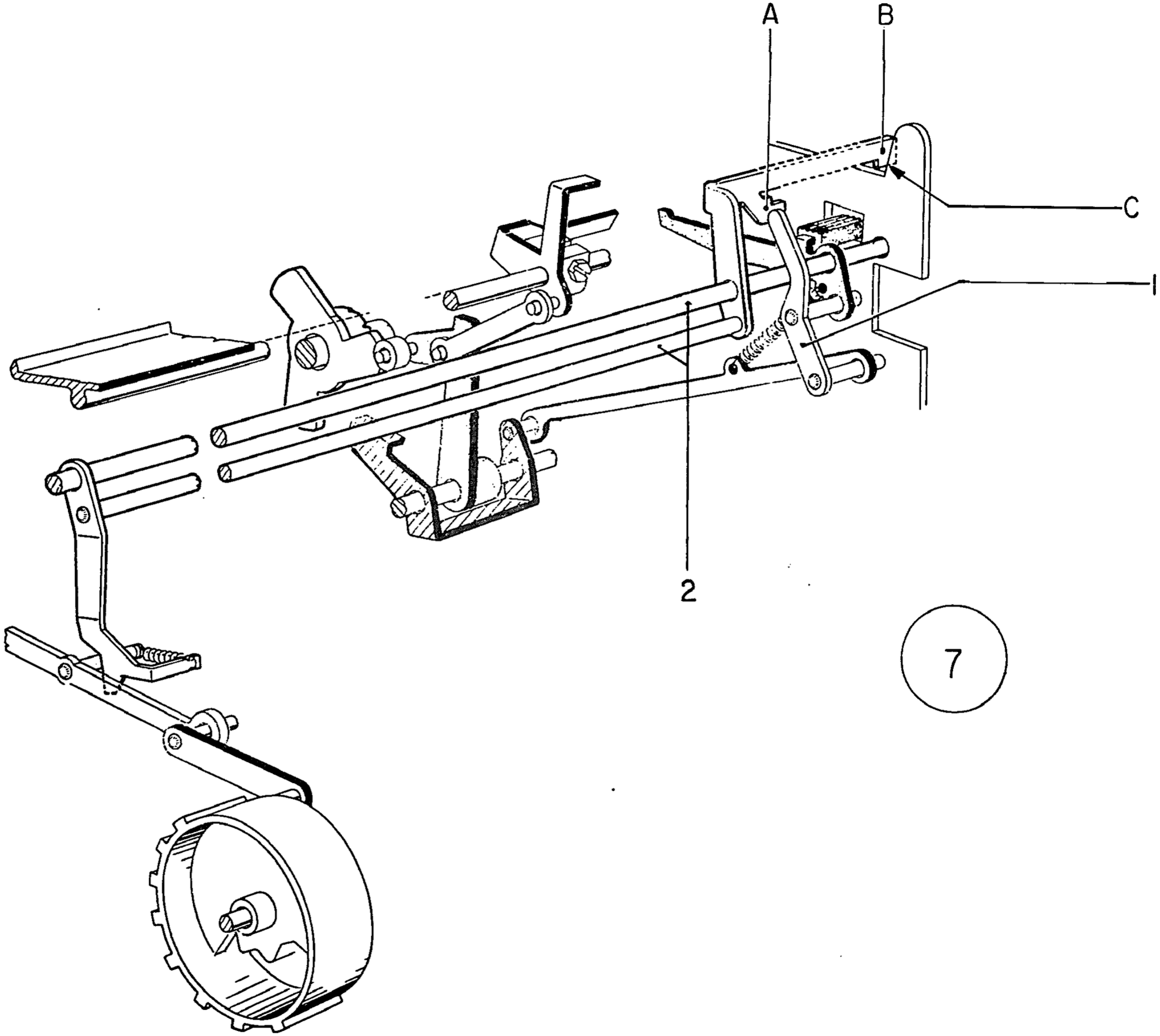
  Note. In this position only, occasional failure to deactivate can be tolerated.

- Shift the segment to lower case and set the copies control dial at 1-4. Check that the keyboard deactivates when two keys are depressed simultaneously.

To adjust:

- If keyboard deactivation does not occur when two keys are depressed simultaneously, form the wing (A) rearward.
- If keyboard deactivation occurs during single-key depression, form the wing (A) forward.

  Note. When forming the wing (A) be careful not to alter the position of the wing (B).


A
B
C
1
2
7

SECTION 18

BACKSPACE
AND
KEYBOARD REACTIVATION

INTRODUCTION TO BACKSPACE AND KEYBOARD REACTIVATION

The back space key, besides providing single and repeat backspacing of the carriage, is also used to reactivate the keyboard after a double-key depression has deactivated it.

As a result of a double-key depression:

- The carriage has advanced one space.
- The input control latch holds the print cam starting lever, preventing subsequent print cycles (keyboard deactivation).

Depression of the back space key after deactivation will:

- Backspace the carriage.
- Restore the input control latch.

These functions are performed by the two profiles of the service cam group:

- The outer profile backspaces the carriage.
- The inner profile:
  - Restores the input control latch.
  - Relatches any pull links that may be released as a result of a multiple-key depression or during a line lock operation.
  - Restores the print cam activating bail if the bail is held by either the shift or space bar reciprocal lock.

BACKSPACE MECHANISM (REST POSITION)

The service cam group is held at rest position by the roller (A) of the activating lever (2) through the tension of spring (3).

The starting lever (13) is holding the flange (14), keeping the two ratchet pawls (1) disengaged from the ratchet.

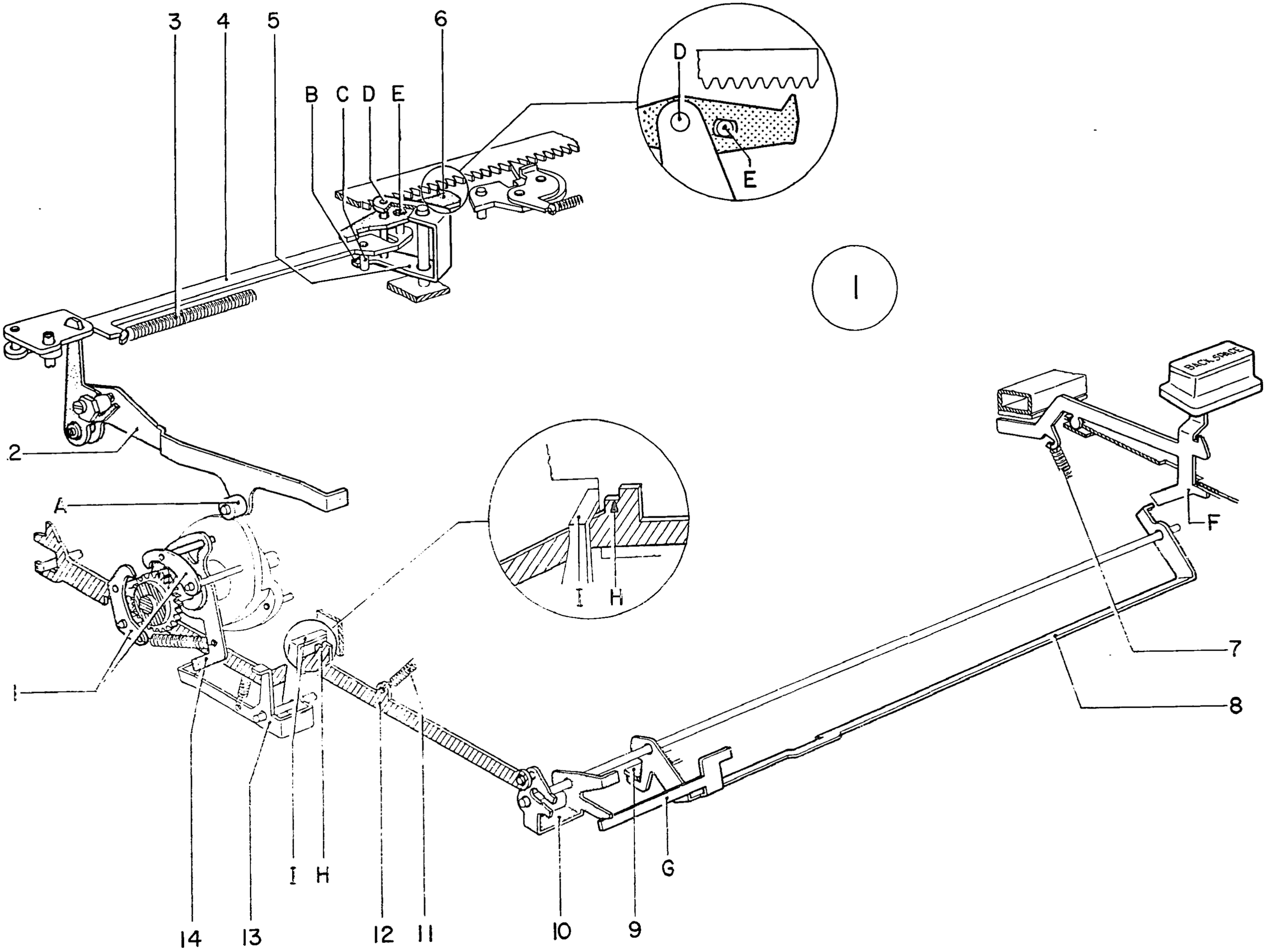
The push link (4) being at rest establishes the rest position of the backspace pawl support bridge (5) by means of the pin (D). In this position the extension (B) of the bridge (5) angularly locates the push link in a forward position. The pin (E) of the push link holds the backspace pawl (6) disengaged from the rack (see upper detail).

The back space key lever is at rest with its extension (F) against the rubber pad of the keyboard housing under tension of the spring (7).

The backspace command bail (8) rests of its own weight on the rubber pad (9).

The command bridge (10) resting on the extension (G) of the bail, through the tension of the spring (11) establishes the rest position of the trip link (12).

With the wing (I) of the starting lever at rest against the side plate of the machine, the step (H) of the link (12) must be in front of, and clear of, the wing I (as shown in the lower detail).


3
4
5
6
B
C
D
E
D
E
1
2
A
BACK SPACE
F
I
H
7
8
1
I
H
G
14
13
12
11
10
9

ACTIVATION

When the back space key is depressed normally, the extension of the key stem (8) contacts and rotates the command bail (9) in the direction of the arrows. The extension (E) of the bail rotates the command bridge (10), and moves the link (11) rearward. The step (F) of the link rotates the starting lever (12), the flange (13) is released, and the service cam clutch engages.

The rotation of the service cam allows the activating lever (1) and crank (2) to rotate through the tension of the spring (3), as indicated by the arrows. This movement drives the push link (4) toward the right and, through the pin (C), rotates the backspace pawl support bridge (7), As the extension (A) leaves the stud (B), the push link starts to swing rearward, causing the pin (D) of the push link to rotate the backspace pawl (6) into engagement with the rack. (Refer to inset A.)

As the push link continues to move to the right, the carriage is also moved in the same direction by the backspace pawl.

After the carriage moved to the right one space, the escapement dog (5) engaged one tooth on the rack to the left of where it was previously, as indicated by the shaded tooth in the inset B.

At the completion of the backspace cycle, the parts 1, 2, 4, 6 and 7 are back at rest position through the action of the service cam. The escapement dog is again holding the carriage which has backspaced one space.

If the back space key is held fully depressed, the described action occurs in the same manner. However, in this case the service cam will rotate continuously, causing repeat backspace cycles.

The following page describes in detail the various phases in which the backspace pawl moves.

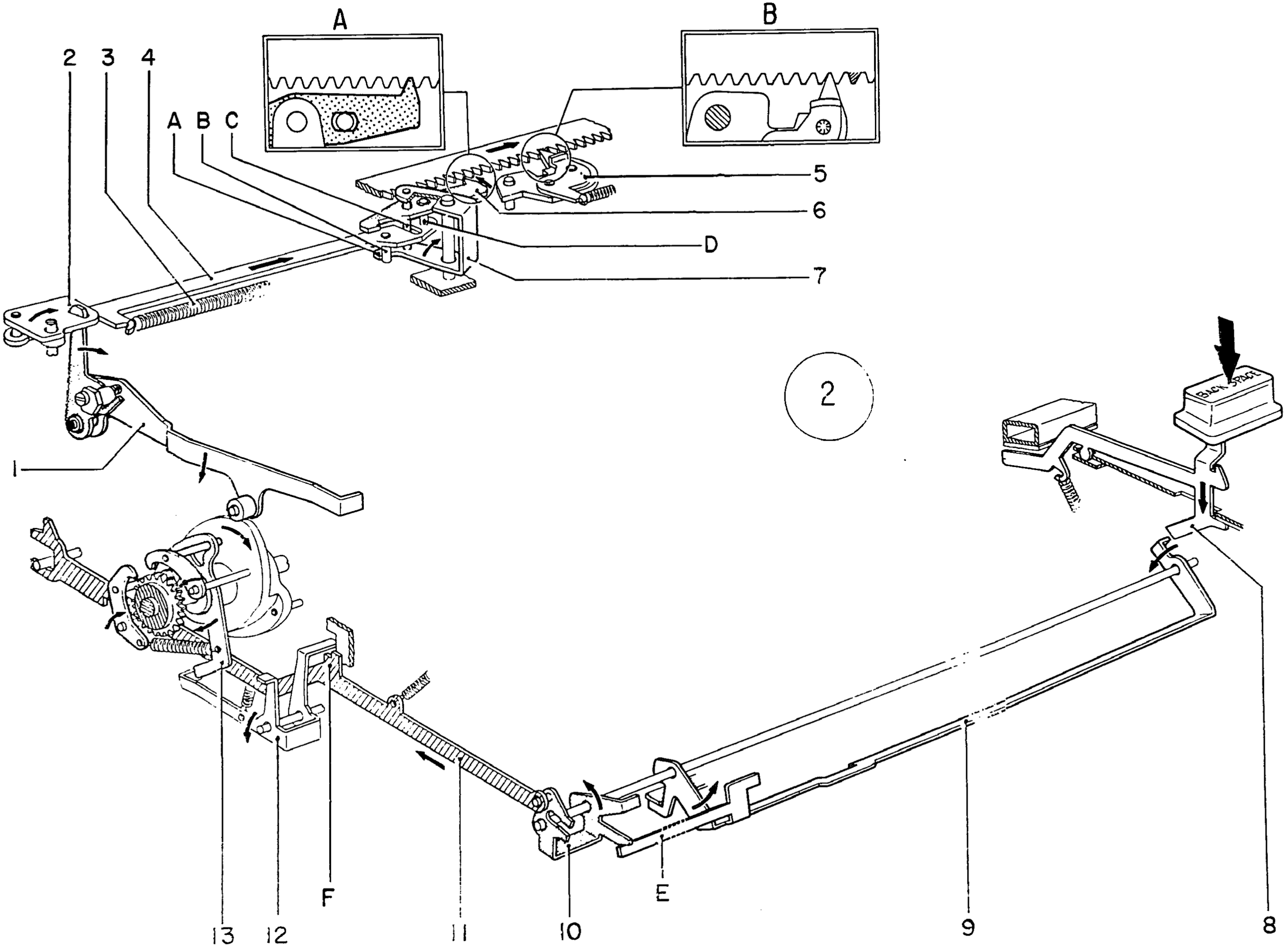
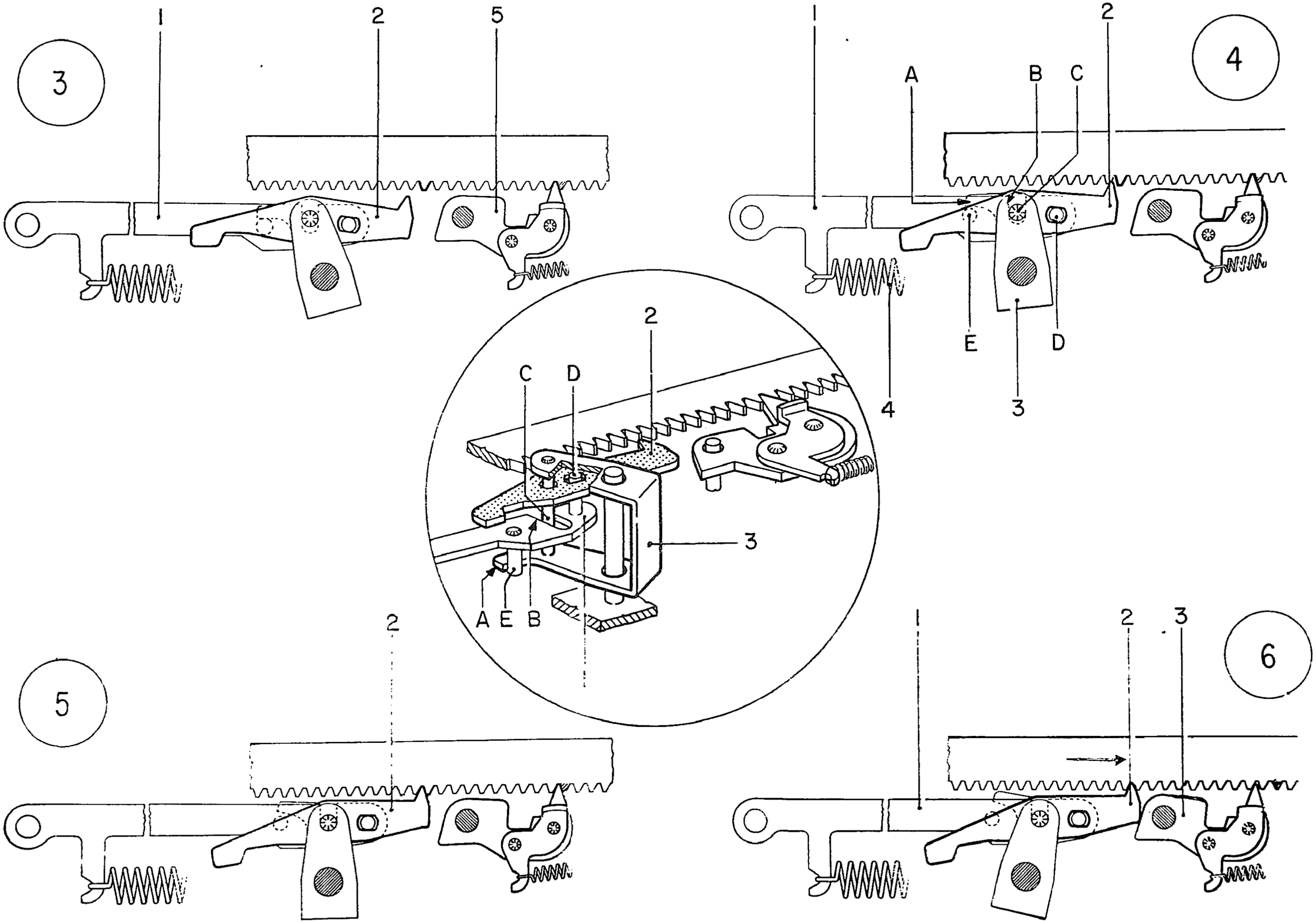

A
B
A
B
C
D
BACK SPACE
E
F

Figure 3 shows the push link (1) and backspace pawl (2) at rest position. The carriage is held at rest position by the escapement dog (5) which is engaged with the shaded tooth of the rack.

Figure 4 shows that the push link (1) has started to move toward the right through the tension of the spring (4). The edge (B) of the slot in the push link pushes against the stud (C), causing the support bridge (3) to rotate. The extension (A), rotating away from the pin (E), allows the push link (1) to swing rearward. Through this action the pin (D) rotates the backspace pawl (2) into the rack.

In figure 5 the push link has moved further to the right, and has completed its rearward movement. The backspace pawl (2) is fully engaged in the rack. In this position the backspace pawl can now control movement to the right (backspacing) of the carriage.

In figure 6 the push link (1) has completed its travel to the right, since the backspace pawl (2) has limited against the escapement dog (5). Through this action the carriage moved to the right, allowing the escapement dog (5) to engage a tooth to the left of where it was previously.


A
B
C
E
D
C
D
A
E
B

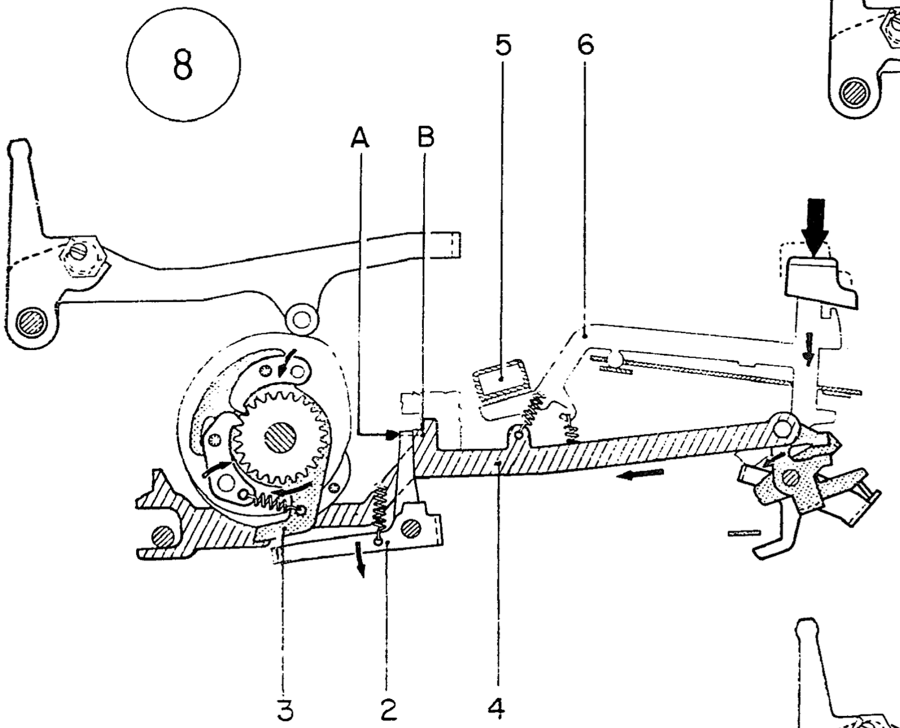
SINGLE BACKSPACE CYCLE

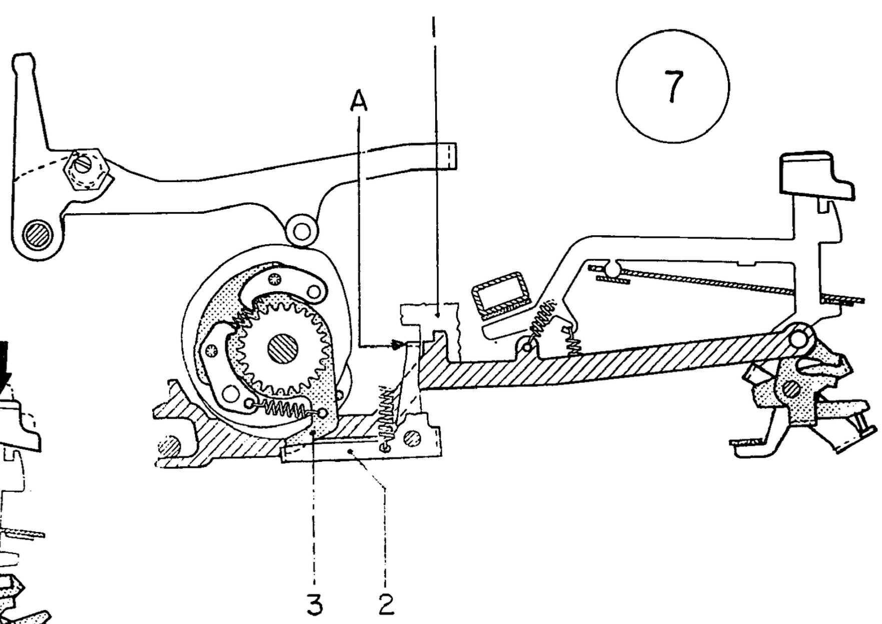
When the back space is depressed to the single-cycle position, the service cam must cycle only once, even though the back space key is held depressed. It is therefore necessary that, during a normal backspace cycle, the starting lever be restored to preset the stopping of the cam at 360 degrees of the cycle.

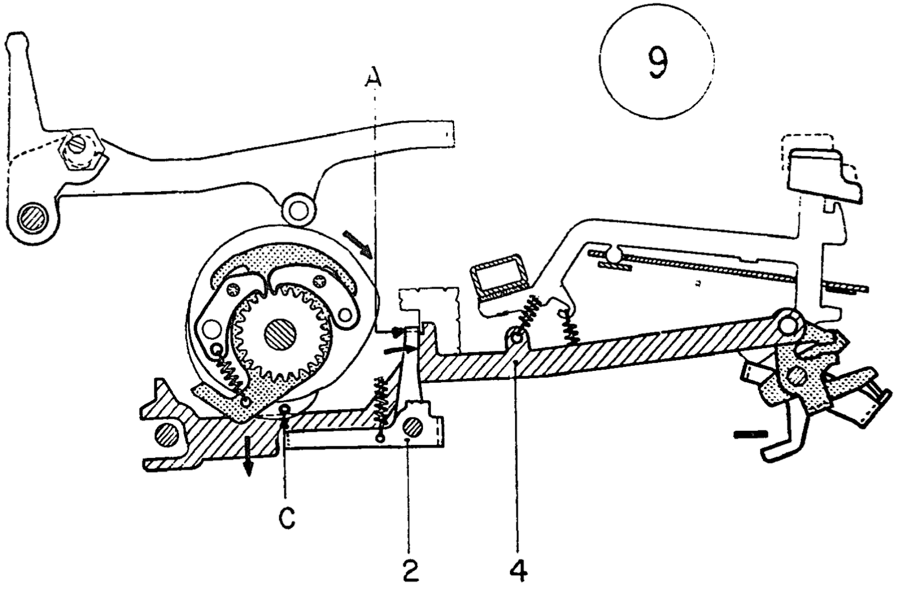
In figure 7 the backspace command mechanism is shown at rest. In this position the wing (A) of the starting lever (2) is at rest against the side plate (1) of the machine, and the flange (3) is held by the starting lever.

In figure 8 the back space key is depressed to the single-cycle position, that is, with the rear of the key lever (6) limiting against the locking bar (5). The trip link (4) has moved to the rear and its wing (B) is pushed against wing (A) of the starting lever, causing the latter to rotate. The flange (3) is released and the service cam clutch engaged.

Figure 9 shows that during the rotation of the service cam, the pin (C) of the cam lowered the link (4). Consequently, the step of the link (4) lost contact to the wing (A) of the starting lever (2), and the starting lever returned to rest position through the tension of its spring. Thus, the service cam is preset to stop at the completion of the cycle, even though the back space key is held depressed.


A
B


A


A
C

REPEAT BACKSPACE CYCLES

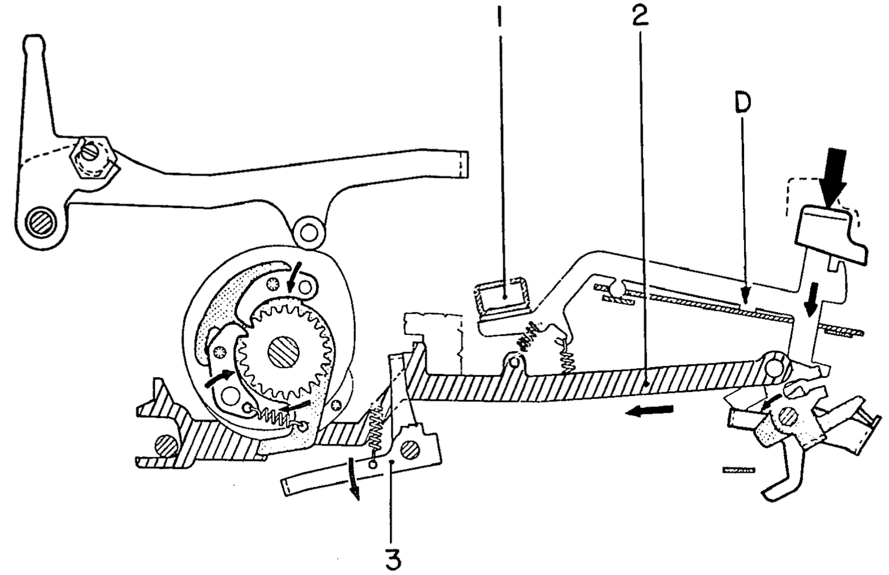
To obtain repeat backspacing, the back space key must be held fully depressed. The carriage will then backspace one space for every cycle the service cam is allowed to rotate.

Figure 10 shows that the back space key has been fully depressed. In this position the boss (D) of the key lever limits on the keyboard housing, and the locking bar (1) is raised against the tension of its spring (not shown in figure).

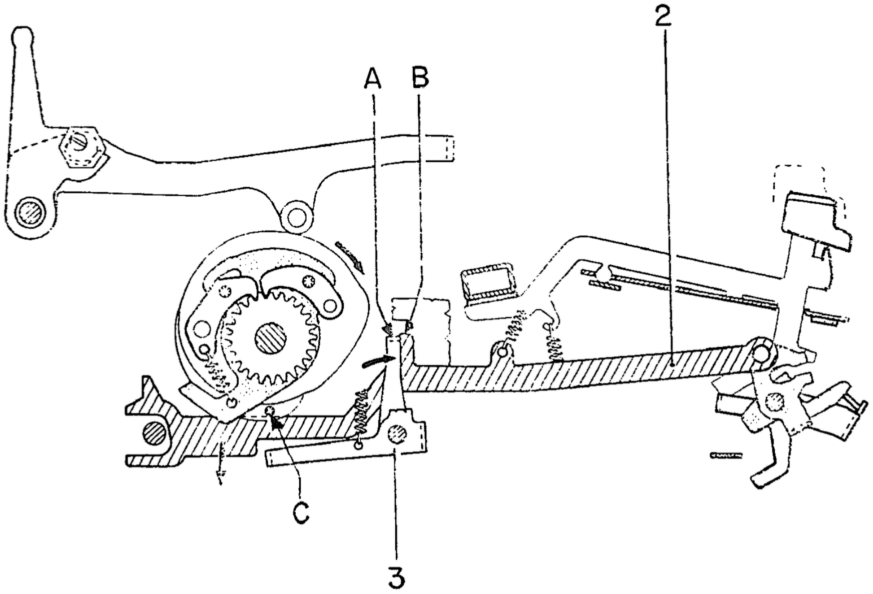
Since the back space key has been depressed to a greater distance than during a non-repeat cycle, the link (2) and starting lever (3) also moved a greater amount. However, the flange is released, the service cam clutch is engaged, and the cam is preset to rotate.

Figure 11 shows that during the rotation of the service cam, the pin (C) lowered the link (2) in the same manner as in single cycles. The starting lever (3) restored slightly until its wing (A) limited against the spur (B) of the link (2). In this position the starting lever is held out of the path of the flange, and the cam can cycle continuously until the back space key is released

10



11



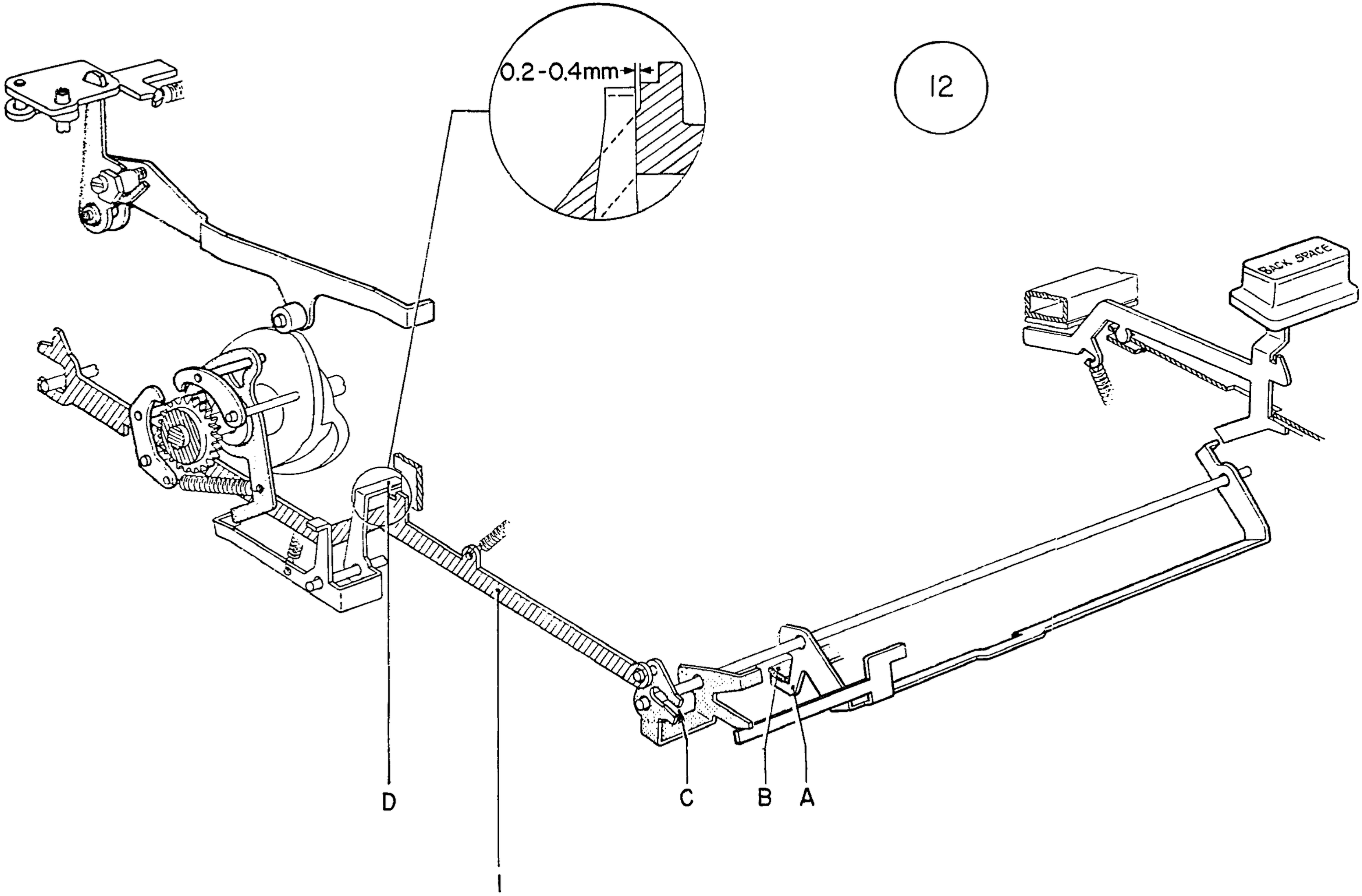
Back Space Trip Link Adjustment.

This adjustment assures that when the back space key is depressed, the service cam clutch will engage.

With the machine in the rest condition, check that the following conditions exist:

- The arm (A) of the command bail rests against the rubber pad (B).
- The wing (D) of the starting lever is at rest against the side plate.
- With the above conditions there must be a clearance of 0.2 to 0.4 mm between the wing (D) of the starting lever and the step of the trip link (1).

To adjust, form the U-shaped opening (C) in the command bridge, as required.


0.2-0.4mm
12
BACK SPACE
D
I
C
B
A

Back Space Block-Out Arm Rest Position Adjustment.

The purpose of this adjustment is to assure the full rotation of the activating lever (1) during a backspace operation.

To check:

- Temporarily disconnect the spring (3) to prevent interference of the half space control bridge (4).

- Check that the wing (D) is resting on step (E).

- Depress the back space key and slowly turn the power shaft. Observe that the wing (C) of the activating lever (1) clears the step (B) and the front edge of the block-out arm (2) between 0.2 to 0.4 mm, as indicated in the center inset.

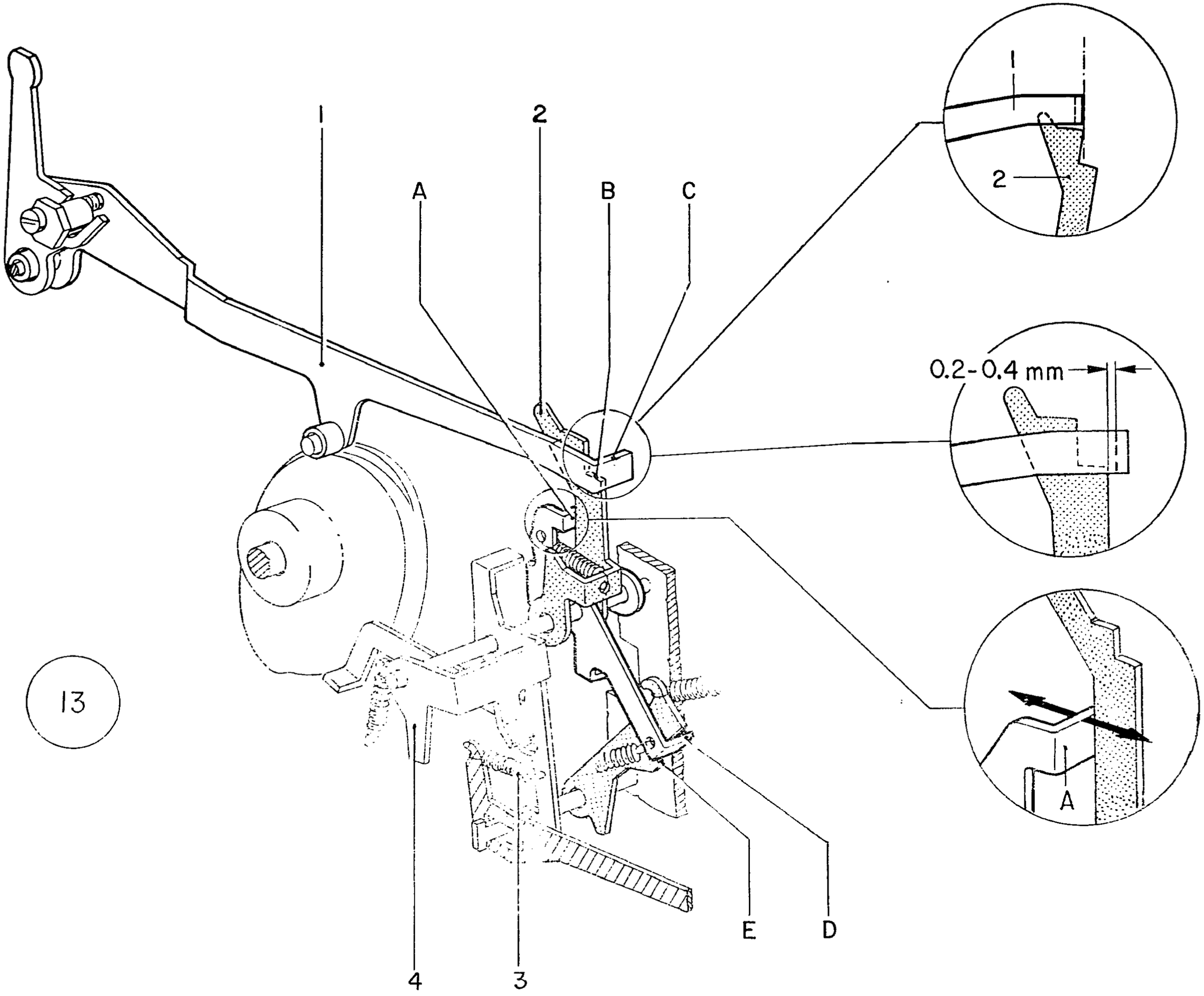
To adjust:

- Form the wing (A) of the control lever back or forth as required. (Refer to lower inset.)

- After the adjustment, check the following:
  - During non-backspace service cycles the block-out arm (2) must position under the wing (C) of the backspace activating lever (1) as indicated in the upper inset.
  - Recheck the Half-Space Control Bridge Rest Position Adjustment in Section 19, page 216.

Full Back Space Movement of Carriage Adjustment.

The full backspace movement of the carriage is automatically obtained when the half-space movement of the carriage is correct. (Refer to the Half-Space Movement of Carriage Adjustment in Section 19.)


1
2
A
B
C
2
0.2-0.4 mm
A
13
4
3
E
D

KEYBOARD REACTIVATION

Figure 14 shows the condition of the deactivation mechanism after the depression of two character keys, followed by the depression of another key:

- The pull link (5) of the last key depressed remains unlatched.
- The starting lever (8) is held by the input control latch (10).
- The print cam activating bail (11) and its extension (9) are rotated and, therefore, not in position to hold the starting lever (8).

ASSEMBLY (REST POSITION)

The crank of the reset frame operating shaft (2) rests on the inner profile of the cam (1). The crank of the shaft (2) controls the position of the reset frame (4) and its relation to the pull link (5), through the connecting links (3 and 6).

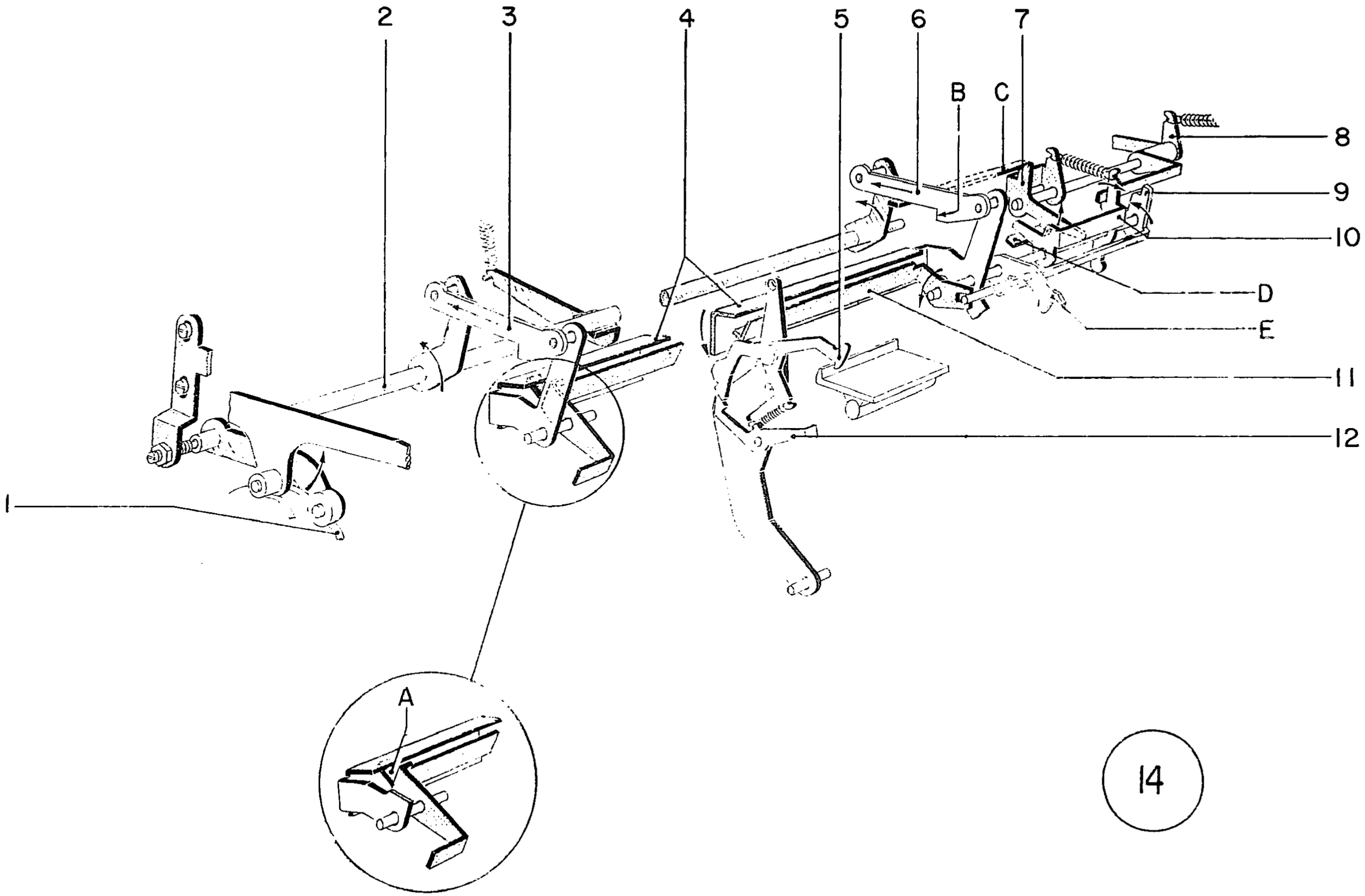
The wing (C) of the input control latch restore bridge (7) is positioned in the path of step (B) of the connecting link (6).

The figure shows the input control latch (10) holding the wing of the starting lever (8), preventing the release of the print cam group. The print cam activating bail extension (9) is held away from the starting lever (8) because the released pull link is holding the bail (11) in a raised position. When the extension (9) is in this position, its reciprocal lock arm (E) will prevent the release of the spacing cam starting lever (not shown in figure).

To restore the pull links (5), the reset frame (4) must be rotated.

To resume typing it is necessary to:

- Position the print cam activating bail extension (9) so it will be in position to hold the starting lever (8).
- Rotate the input control latch (10) to release its hold on the starting lever (8).



14

ACTIVATION

During a service cycle, the cam (1) rotates the reset frame operating shaft (2) in the direction of the arrows, and, through the connecting links (3 and 6), rotates the reset frame (4).

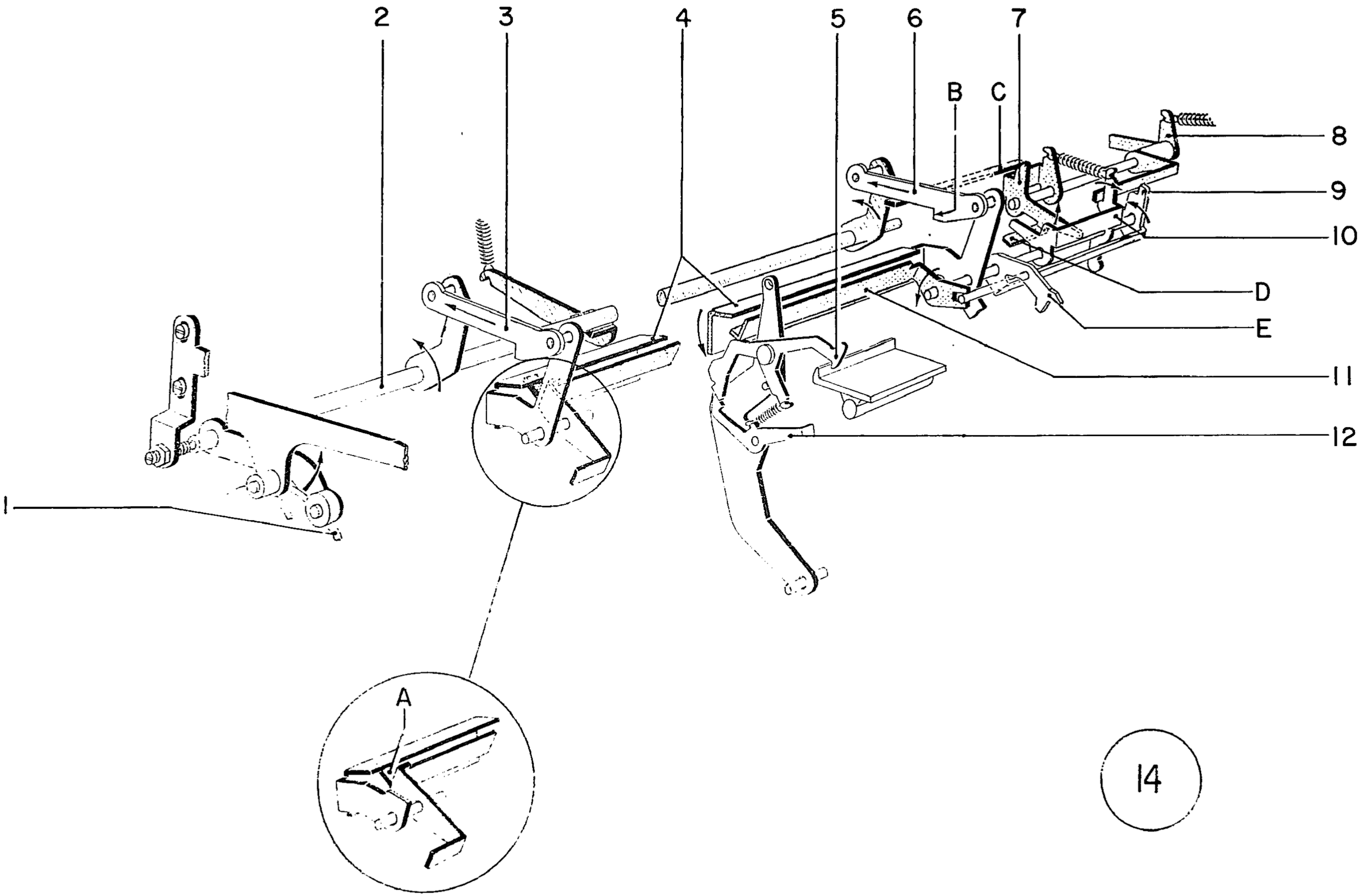
The rotation of the reset frame:

- Restores the pull links (5) so they can be held by their respective latches (12).
- Restores, through the lug (A) shown in the detail inset, the print cam activating bail (11) and extension (9) into position to hold the starting lever, when the latter is released by the input control latch (10). This is especially necessary if the activating bail (11) is held in "memory" by either the shift or space bar reciprocal lock.

During the rotation of the reset frame operating shaft (2), the step (B) of the connecting link (6) contacts the wing (C) and rotates the input control latch restore bridge (7). The restore bridge, in turn through its wing (D), rotates the input control latch (10), causing it to release its hold on the starting lever (8).

The starting lever, actuated by its spring, rotates slightly until held by the already restored bail extension (9).

The continuing rotation of the cam (1) causes the operating shaft (2) to rotate (opposite to the direction of the arrows), allowing the reset frame (4) and input control latch restore bridge (7) to move to rest. With the restore bridge (7) back at rest, the input control latch (10) again rests against the side of the wing of the restored starting lever (8).



14

Reset Frame Adjustment (Figures 15 and 16).

When the keyboard is deactivated as a result of multiple-key depression or a line lock operation, one or more pull links will be unlatched at the end of the cycle.

During any cycle of the service cam, the reset frame (3) must relatch the pull links (4). This can be checked as follows: Operate a service cycle by hand, and observe that the reset frame relatches the pull links with an overtravel of 0.5 mm, as shown in figure 16.

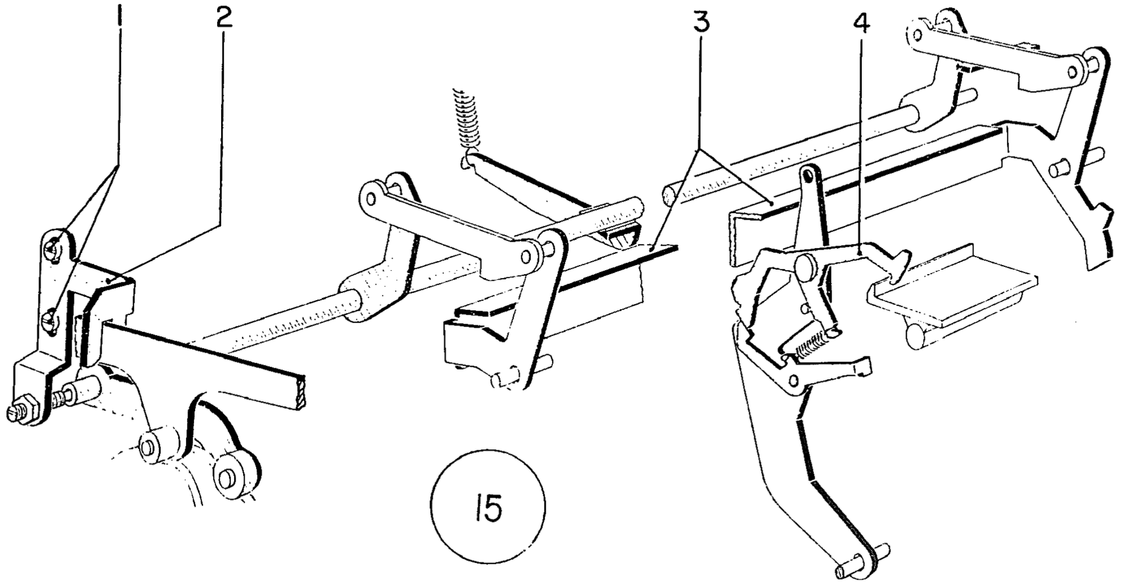
To adjust for the above condition, loosen the two screws (1), and position the bracket (2) up or down, as required.

Input Control Latch Release Adjustment (Figure 17).

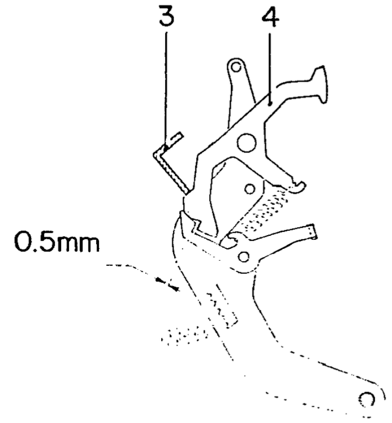
To reactivate the keyboard the input control latch (6) must release its hold on the starting lever (5).

Check the reactivation operation as follows: Depress the back space key, and slowly turn the power shaft until the input control latch (6) reaches its maximum rotation. At this time a minimum clearance of 0.3 mm should exist between the wing of the starting lever (5) and the step of the input control latch (6). (See detail inset.)

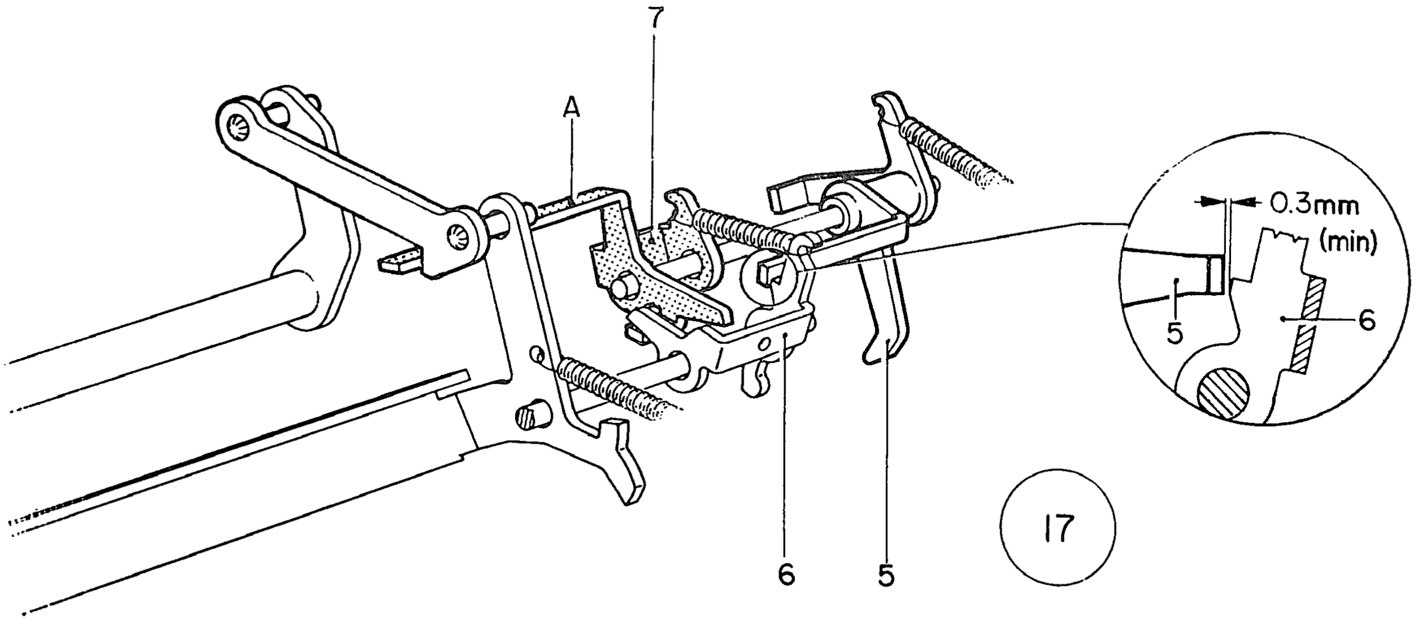
To adjust the clearance, form the wing (A) of the input control latch restore bridge (7) back or forth, as required.



15



16



17

SECTION **19**

HALF SPACE

INTRODUCTION TO HALF SPACE

The half-space feature facilitates the replacement of one word with another which contains either one more or one less character than the original word. Operation of the half space key backspaces the carriage one half space.

A feature of this mechanism is that the half space key is only depressed once, and is released when the required correction has been made. Everything that is typed while the half space key is depressed is offset one half space from the normal spacing of the machine.

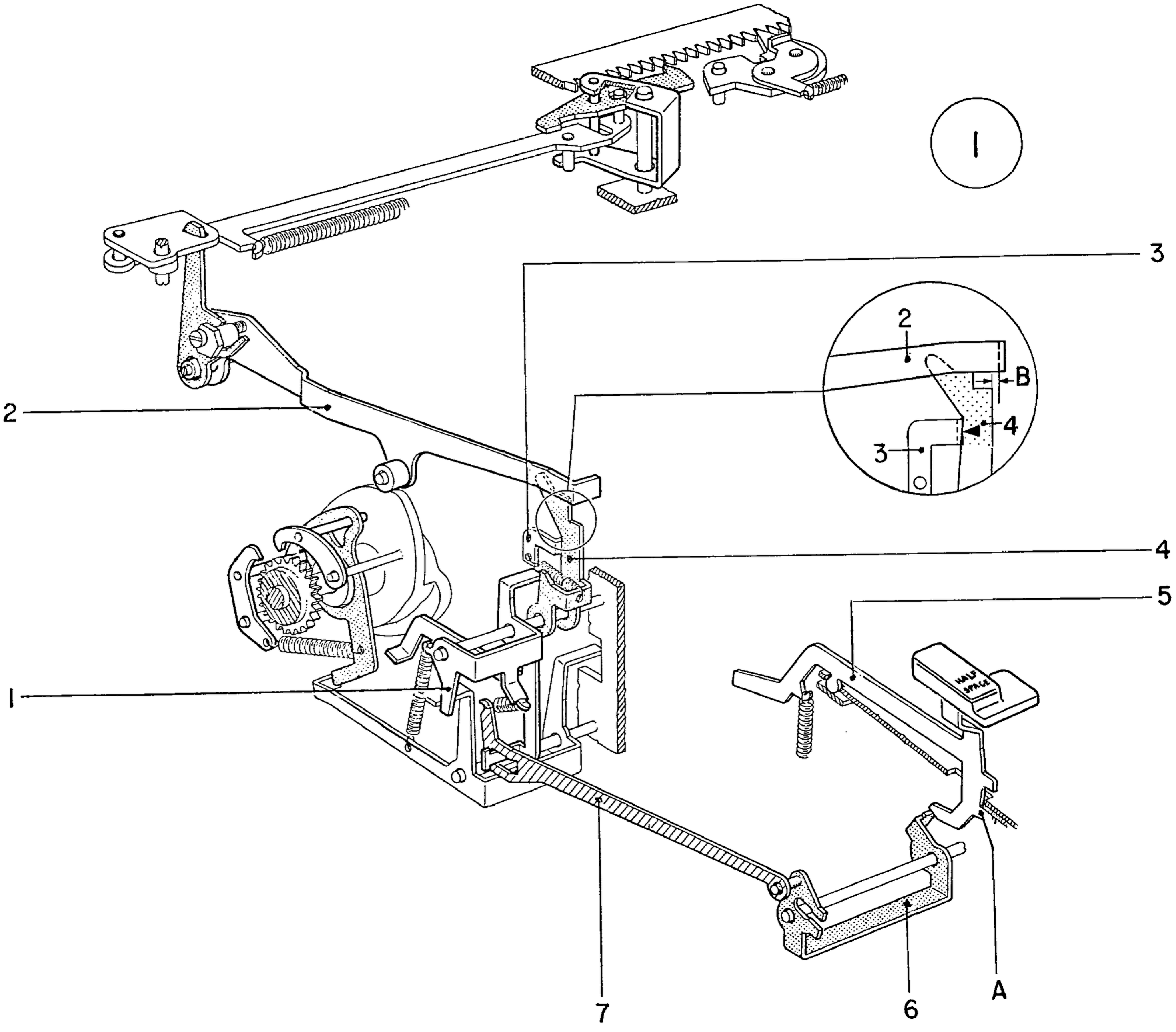
Because the half space is half of a back space operation, all that is necessary is to interrupt the backspace mechanism after it has moved the carriage one half a space.

ASSEMBLY (REST POSITION)

Figure 1 shows the half space mechanism at rest. The extension (A) of the half space key lever (5) rests against the rubber pad under the keyboard, and establishes the rest position for the command bridge (6), trip link (7) and the half space control bridge (1).

The backspace block-out arm (4) rests against the block-out arm control lever (3). In this position the block-out arm will not interfere with the rotation of the activating lever (2).

The clearance B exists between the wing of the lever (2) and the front edge of the block-out arm (4), as shown in the detailed inset.


I
B
HALF SPACE
A

ACTIVATION

The command mechanism performs the following:

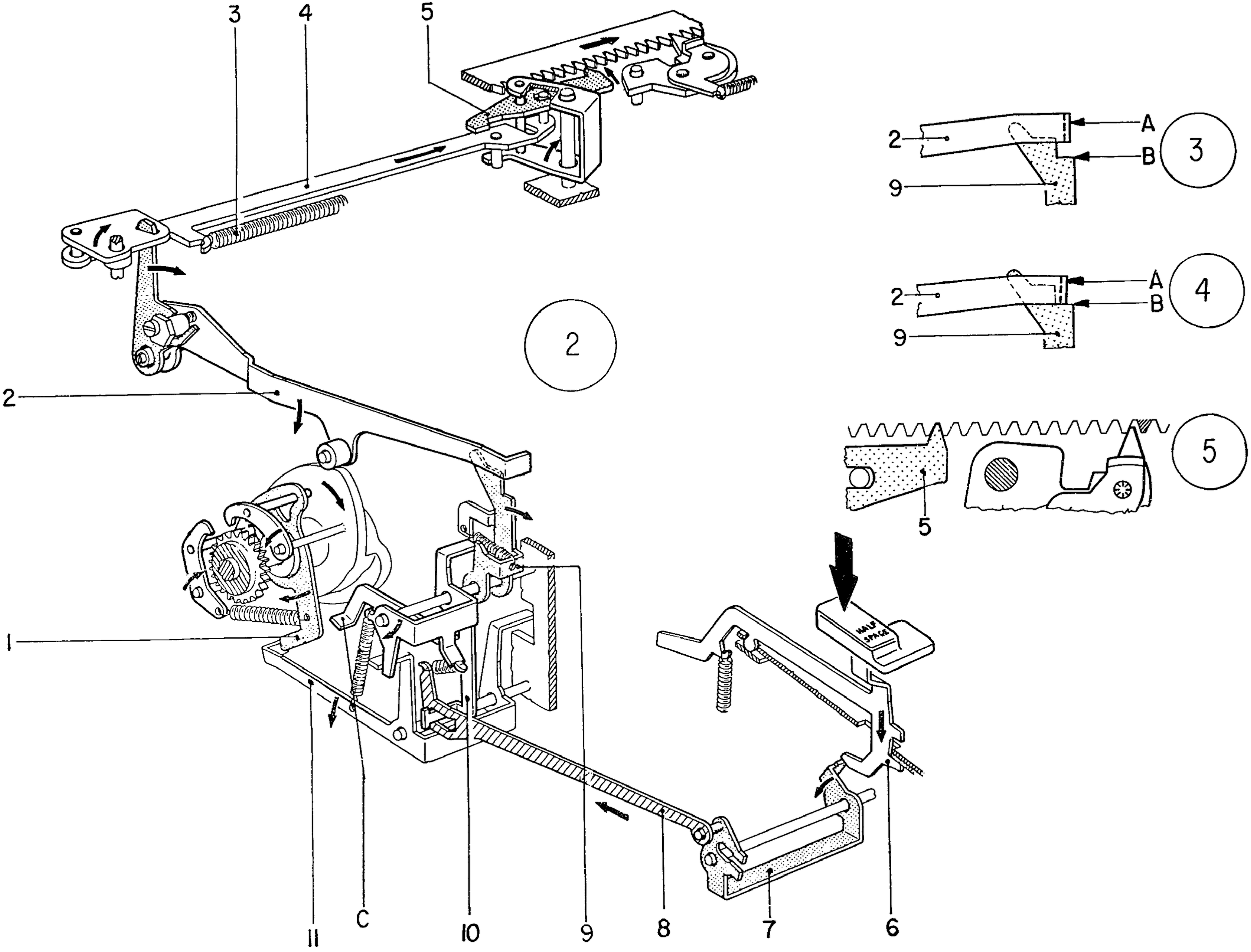
- Engages the clutch to start a service cycle.
- Presets for stopping the backspace activating lever after a half space carriage movement.

When the half space key (6) is depressed, it rotates the command bridge (7) in the direction of the arrow, and moves the trip link (8) rearwards. The movement of the trip link rotates the half space control bridge (10) which, in turn, rotates the starting lever (11) and releases the flange (1), thus engaging the clutch.

At the same time that the control bridge (10) rotates, it also moves the block-out arm (9) forward (figure 3), placing the step (B) in the path of the downward movement of the wing (A) of the backspace activating lever (2).

As the service cam rotates, the spring (3) moves the backspace push link (4) toward the right, engaging the backspace pawl (5) in the rack. The continued movement of the push link (4) moves the carriage to the right until the wing (A) of the activating lever (2), contacts the lower step (B) of the block-out arm (9), figure 4. The limited movement of the activating lever (2) has only allowed the backspace pawl (5) to move the carriage half a space, as shown in figure 5.

To hold the carriage in the half-space position, the service cam must be stopped before the end of the service cycle. As previously mentioned, when the half space key was depressed the control bridge (10) was rotated. This placed the wing (C) of the control bridge in the path of the flange (1). Therefore, as the cam continues to rotate, the flange (1) will contact the wing (C) and disengage the clutch.


C
HALF SPACE
②
③
A
B
④
A
B
⑤

PRINTING WITH HALF SPACE KEY DEPRESSED

Figure 6 shows both the type-action mechanism at rest and the half-space mechanism holding the carriage in the half-space position.

The flange (1) is held by the wing (A) of the half space control bridge (8), and the clutch is disengaged. The service cam was not able to complete its cycle. Consequently, the backspace activating lever (2) is resting on the block-out arm (7), holding the carriage in a half-space position.

When a character key (6) is depressed, the escapement trip shaft (5) is rotated during the resulting print cycle. This causes the arms (B) and (C) to remove the backspace pawl (3) and the escapement dog (4), respectively, from the escapement rack.

The escapement dog (4), when released, advances and engages the next tooth in the rack in the same way as during normal typing. As the carriage moves to the left, the backspace pawl (3) will re-engage the rack one space to the right of its original position.

The carriage, held by the backspace pawl (3), is again in the half-space position, ready for the printing of the next character.

The following page describes the half-space movement of the carriage in detail.

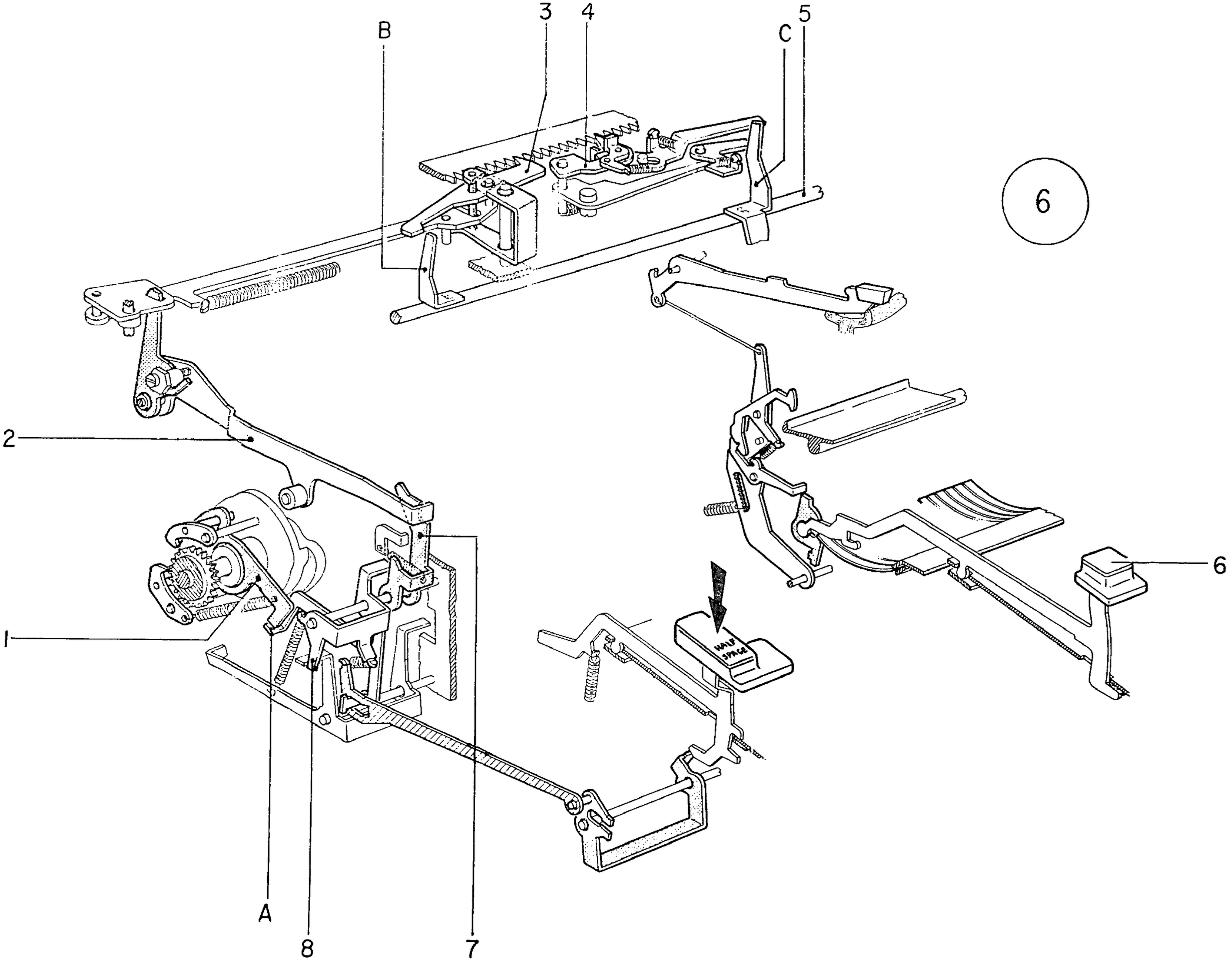

B
C
HALF SPACE
I
A

Figure 7 shows the backspace pawl (1) and the escapement dog (2) in their rest positions.

In figure 8 the half space key has been depressed. The backspace pawl (1) has engaged the rack and moved the carriage one half space to the right. The escapement dog, although still in the escapement rack, is no longer holding the carriage.

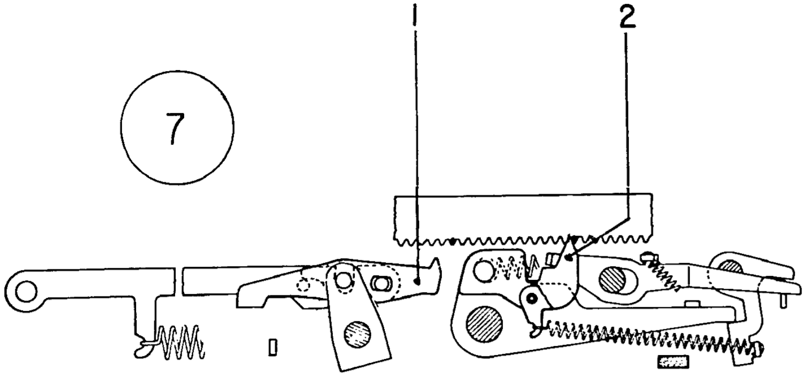
In figure 9 a character key has been depressed. The escapement trip shaft arms (B and C) have removed the backspace pawl (1) and the escapement dog (2) from the rack. The arm (C) has also rotated the latch (4), allowing the advance crank (3) to move the escapement dog (2) to the right into position to engage the next tooth of the rack.

Figure 10 shows the arms (B and C) returned to rest. The main spring, having overcome the inertia of the carriage, has moved the carriage toward the left, and the backspace pawl (1) has engaged the next tooth to the right on the rack. The carriage has, therefore, moved one full space and is again at rest in the half-space position.

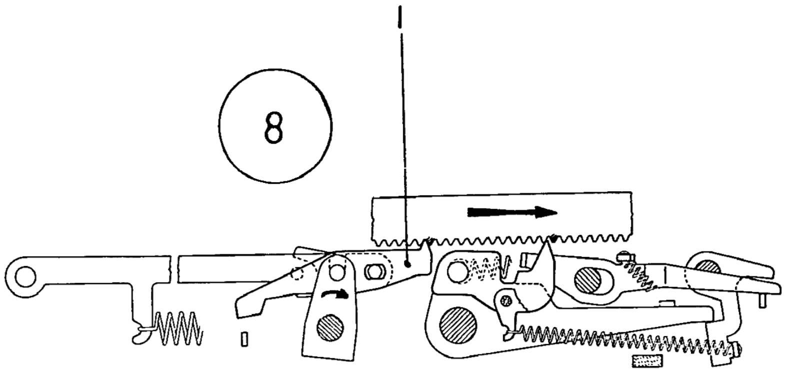
The escapement dog (2), engaged in the tooth to the right of the original one, has also been moved toward the left by the movement of the carriage. This movement, however, is not enough for the full restore of the advance crank (3), and, therefore, the crank is not locked by the latch (4).

When the half space key is released, the service cam can complete its cycle. This restores the backspace pawl (1) to rest, and allows the carriage to move the final half space to the left. With this final movement, the rack pushing on the escapement dog (2) fully restores the advance crank (3) so that it is again held by the latch (4).

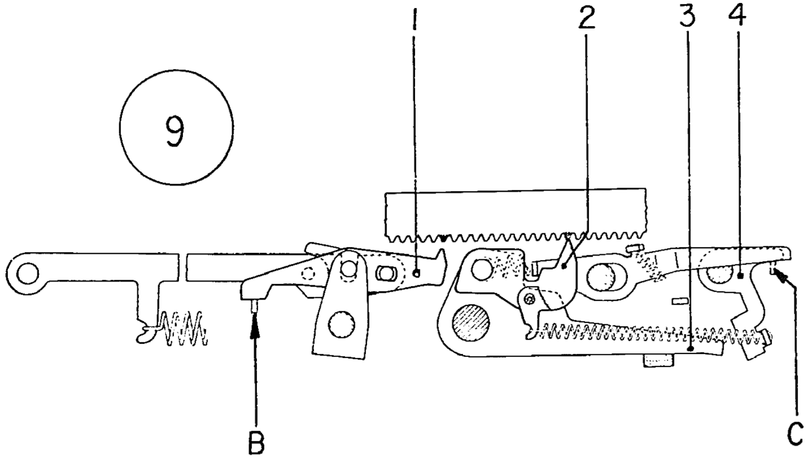
⑦



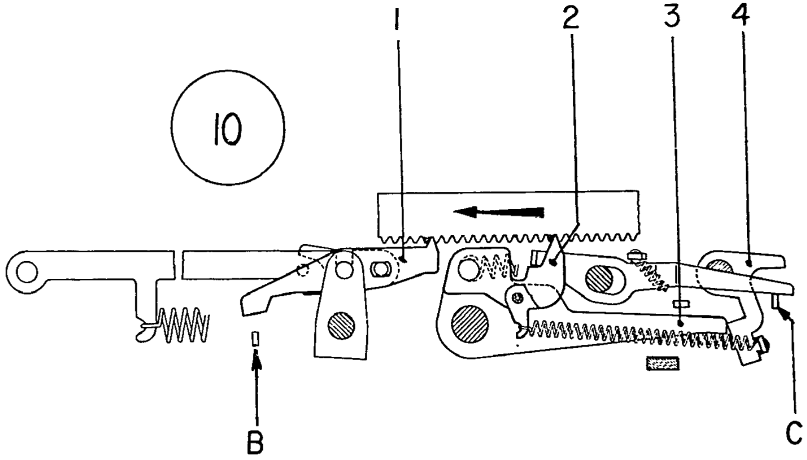
⑧



⑨



⑩



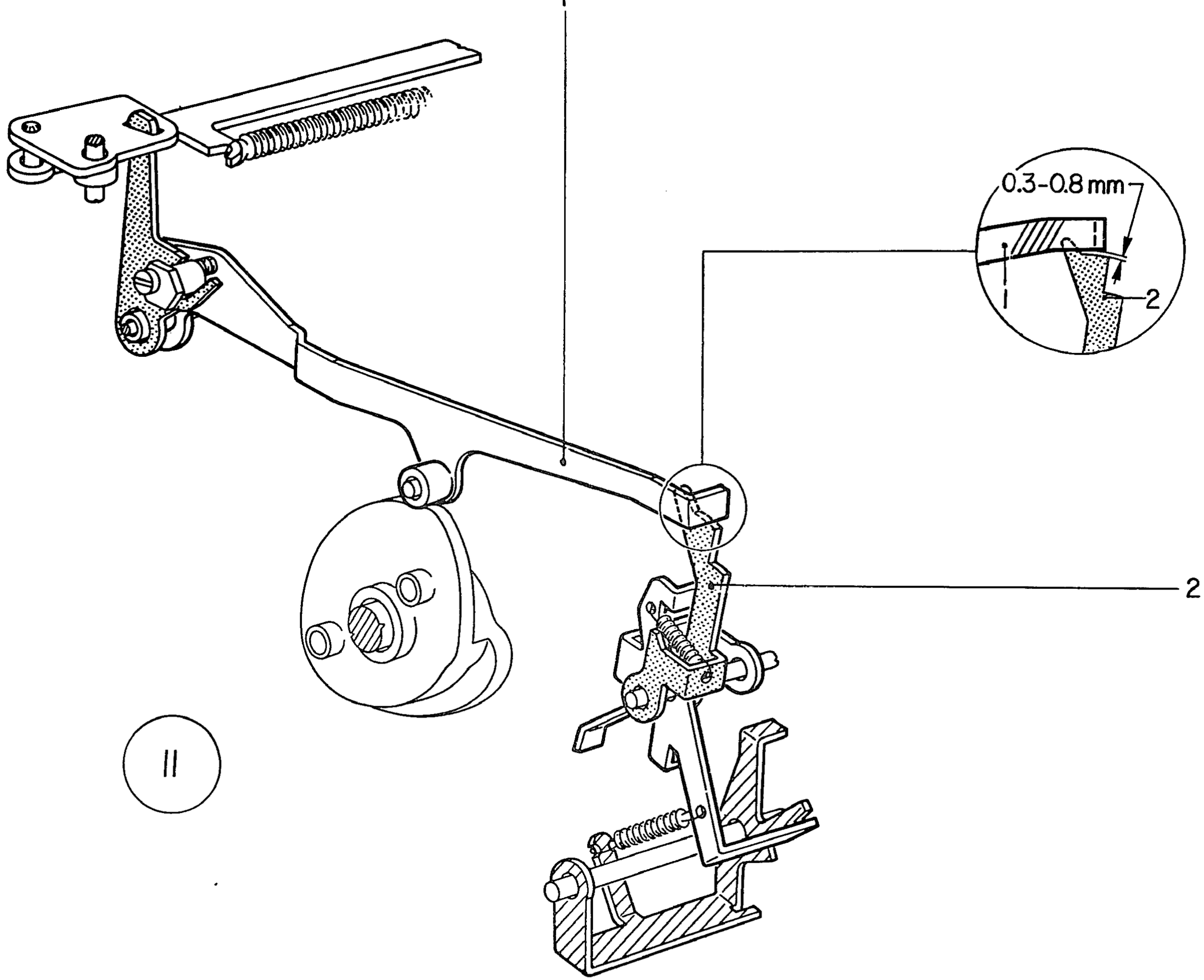
ADJUSTMENTS

BACKSPACE BLOCK-OUT ARM CLEARANCE ADJUSTMENT

To prevent any possibility of the backspace pawl engaging the rack during a non-backspacing service cycle, the block-out arm (2) must be able to safely swing under the wing of the backspace activating lever (1).

With the machine at rest, manually rotate the block-out arm (2) forward, and check that it clears the wing of the backspace activating lever (1) by 0.3 to 0.8 mm as shown in the detailed inset.

To adjust the clearance, form the backspace activating lever (1) in the shaded area shown in the inset.


0.3-0.8 mm
II

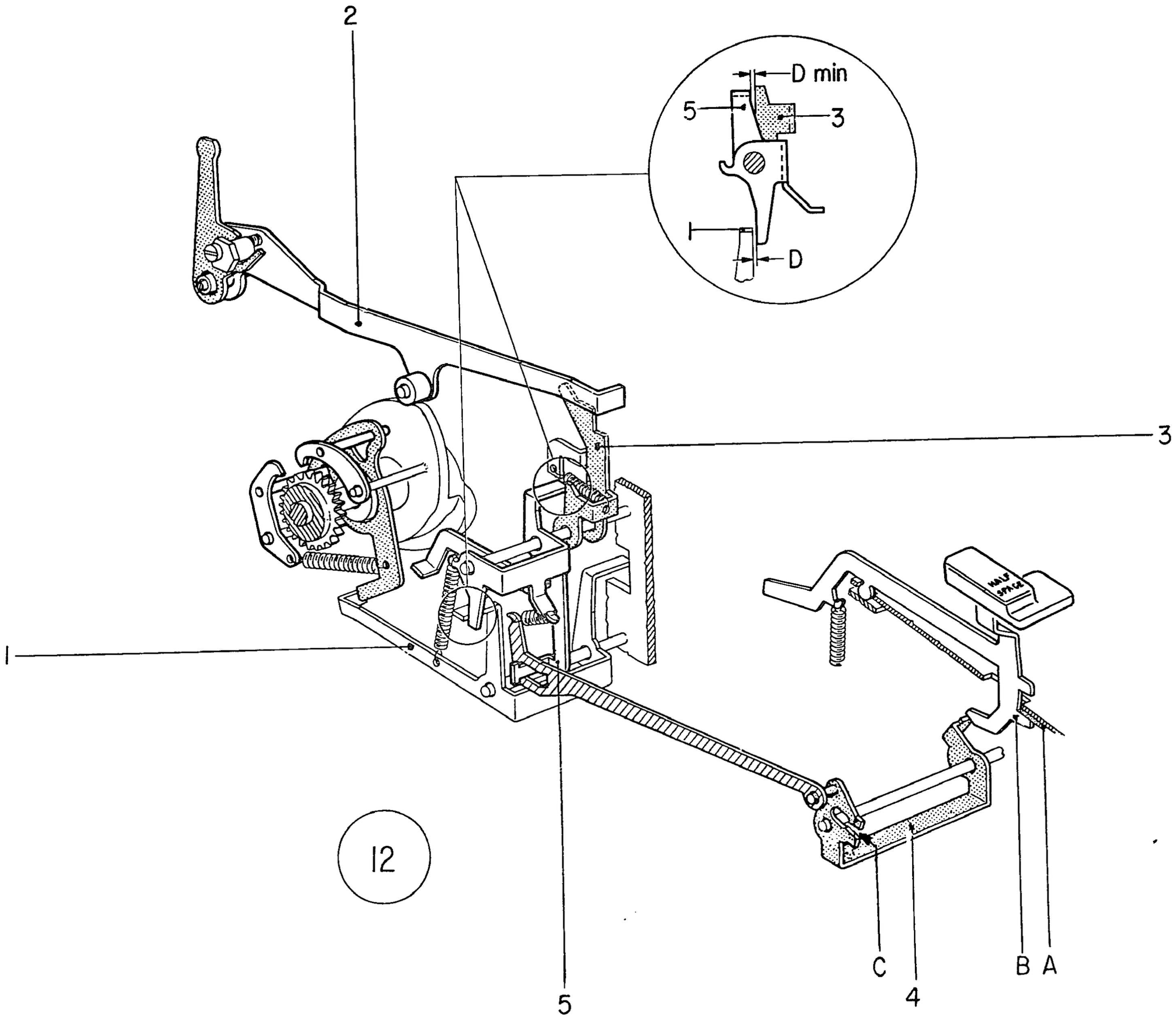
HALFSPACE CONTROL BRIDGE REST POSITION ADJUSTMENT

The block-out arm (3) must be in position to stop the backspace activating lever (2) in the half-space position, before the service cam clutch is engaged.

At rest, there must be a minimum clearance (D) between the upper wing of the halfspace control bridge (5) and the block-out arm (3). At the same time, the lower extension of the control bridge (5) must just clear the wing of the starting lever (1), as indicated in the inset drawing.

To obtain both of the above required conditions:

- Check that the extension (B) of the half space key lever is against the rubber stop (A).
- Open or close the adjusting slot (C) in the command bridge (4), as required.


2
D min
5
3
I
D
3
I
HALF SPACE
5
C
4
B
A
12

HALF-SPACE MOVEMENT OF CARRIAGE ADJUSTMENT

The two following adjustments ensure the correct movement of the carriage when typing with the half space key depressed. The escapement dog release lever adjustment should only be performed when the required condition cannot be obtained with the adjustment of the eccentric.

Eccentric Adjustment.

> Note. It is important that the operator type at a moderate speed when the half space key is depressed.

Check and adjust as follows:

- Type a series of periods with the ribbon set at black.
- Manually return the carriage to the first period printed.
- Depress and hold the half space key.
- Set the ribbon in red and type a series of periods.
- The periods printed in red should be centered between the periods printed in black, as shown in figure 13.
- If periods are not centered correctly, adjust the eccentric (1), figure 15.
- If with the adjustment made so that the periods are centered in relation to each other, the carriage does not space correctly when typing with the half space key depressed, re-adjust the eccentric (1), figure 15, to obtain the condition (with a tolerance of 0.2 mm) shown in figure 14.
- If after re-adjusting to the condition shown in figure 14, incorrect carriage movement still occurs when typing with the half space key depressed, the escapement dog release lever adjustment which follows should be performed.

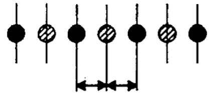
Escapement Dog Release Lever Adjustment.

> Note. This adjustment should not be made unless the adjustment of the eccentric has failed to obtain the required spacing.

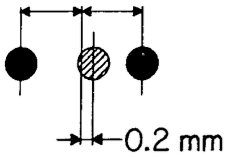
Check and adjust as follows:

- Push the escapement dog release lever (4) rearward (as indicated by the arrow in figure 16), taking care not to move it laterally. When its edge (B) is parallel with the edge (A) of the escapement dog advance crank adjusting plate (3), the wing of the release lever (4) should overlap the escapement dog (2) in accordance with the specifications shown in figure 17.
- To obtain the proper overlap, form the wing of the escapement release lever (4), as shown in figure 18.

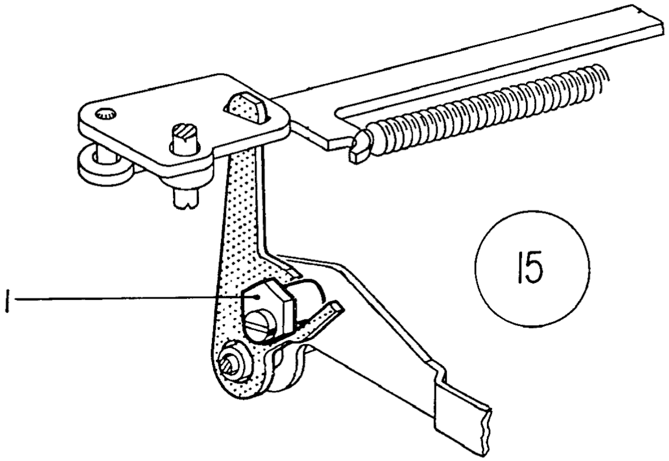
> Note. When the half-space movement of the carriage is set correctly, the full backspace movement will automatically be correct.



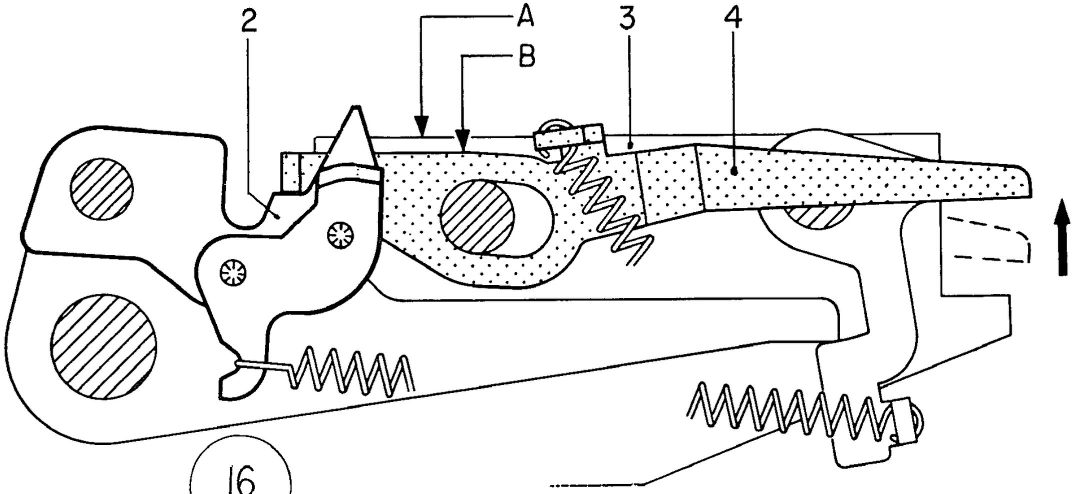
13



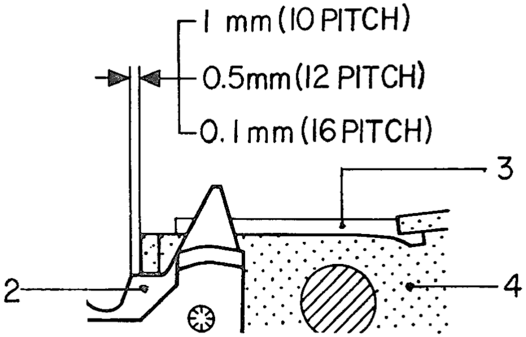
14



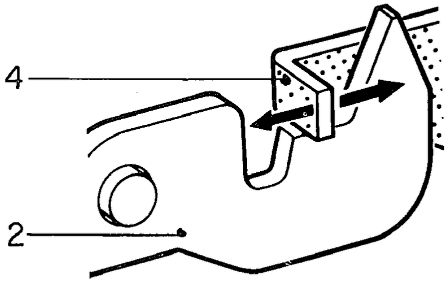
15



16



17



18

SECTION **20**

REVERSE UNDERSCORING

(PRINTING WHILE BACK SPACING)

INTRODUCTION TO REVERSE UNDERSCORING

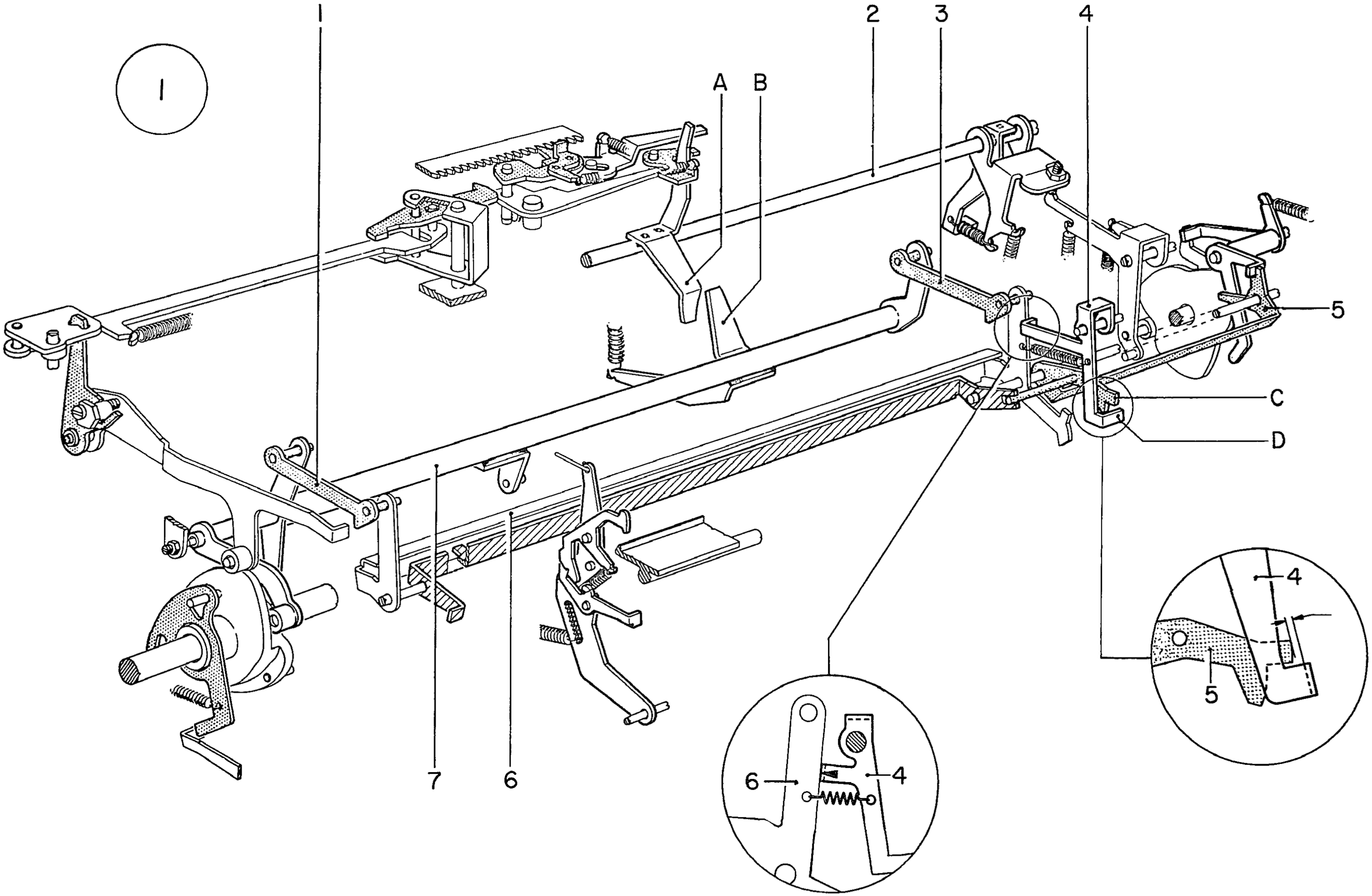
The Editor 4 offers a convenient feature, known as reverse underscoring, which permits printing to occur in rhythmic sequence while the carriage is backspacing. This feature facilitates the underscoring of words or titles.

Reverse underscoring is obtained by fully depressing both the underscore key and the back space key, simultaneously, until the underscoring is completed. Further, any repeat character key can be used in conjunction with the back space key to accomplish reverse typing of the respective character.

ASSEMBLY (REST POSITION)

The parts associated with the reverse underscoring feature are shown at rest position in figure 1.

- The service cam controls the rest position of the shaft (7) and the reset frame (6) through the links (1 and 3).
- Attached to the escapement trip shaft (2) is the finger (A). Attached to the reset frame shaft (7) is the finger (B). The purpose of the fingers is to prevent an escapement trip cycle from occurring during a backspace cycle.
- The print cam interlock lever (4) rests against the vertical arm of the reset frame (6) through the tension of its spring (see lower inset). In this position the wing (D) of the interlock lever is out of the path of step (C) of the print cam activating bail extension (5). The print cam interlock lever (4) controls the timing of the print cycle in respect to the backspace cycle.


I
A
B
C
D

ACTIVATION

When both the back space key and the underscore key are held fully depressed, the backspacing and printing will occur alternately, even though their respective cycles overlap.

During the backspace cycle, the following takes place:

- The backspace pawl (2) enters the rack and moves the carriage one space to the right.
- The reset frame (12) and shaft (1) rotate in the direction indicated by the arrows in figure 2. The rotation of the reset frame prevents the release of the pull links (10) and activating bail (11) as one of its normal functions, but for only a relatively short time during the backspace cycle. It is necessary, therefore, that the release of the print cam starting lever (7) be delayed until later in the backspace cycle to allow time for the escapement trip exclusion to be effective. This delay is accomplished by the print cam interlock lever (6).
- The interlock lever (6), under the control of the reset frame (12), rotates rearward under the tension of spring (5) and places its wing (E) in the path of the step (D). (See lower inset.)
- Towards the end of the backspace cycle, the reset frame (12) and the interlock lever (6) returns to rest position. The wing (E) of the interlock lever releases its hold on the step (D) of the extension (8), and the print cycle starts.

During the print cycle, the following takes place:

- The escapement trip shaft (4) is prevented from rotating since another backspace cycle has already started. The finger (C) rotates in the path of finger (B), preventing the escapement trip shaft (4) from rotating (see upper inset).
- The escapement trip is excluded, since the arm (A) did not release the escapement dog (3).

The above backspace and print cycle movements are described in detail on the following page.

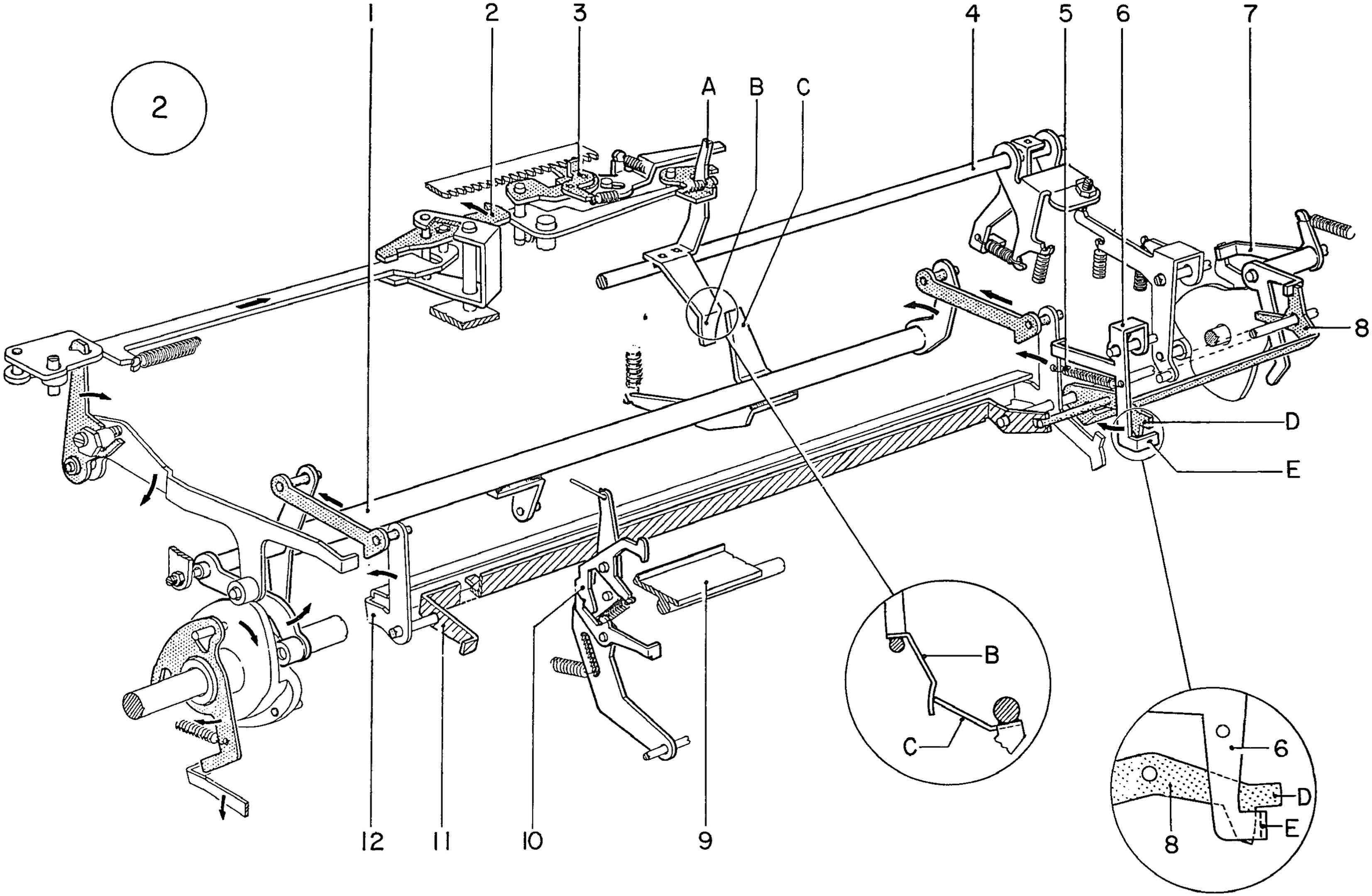

A
B
C
D
E
B
C
D
E

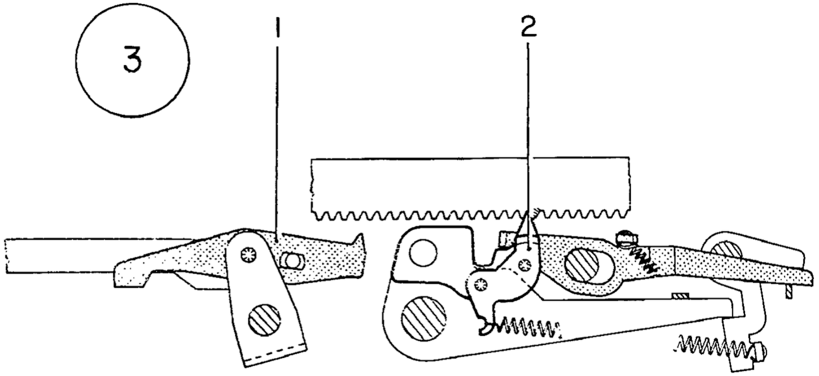
Figure 3 shows the backspace pawl (1) and the escapement dog (2) at rest position.

Figure 4 shows that the backspace cycle is taking place, and that the backspace pawl (1) has moved the carriage one space to the right.

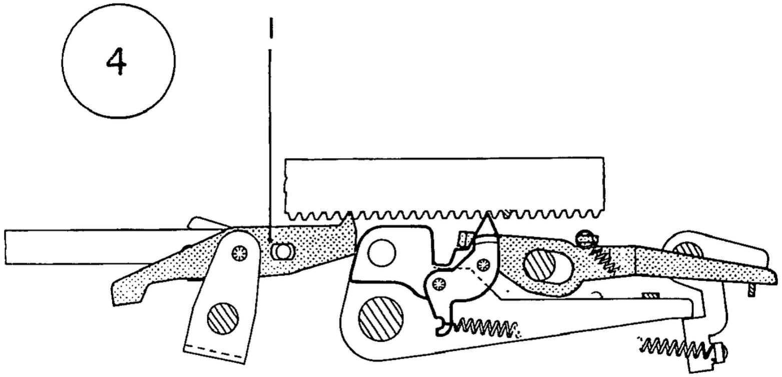
In figure 5 the backspace pawl (1) has returned to rest position, and, at the same time, the printing cycle has started. During the printing cycle the backspace cycle will again start. Consequently, the finger (C) of the reset frame shaft (figure 6) rotates against the finger (B), preventing the escapement trip shaft (3) from rotating. The arm (A), unable to release the escapement dog from the rack, prevents the escapement trip from occurring.

The backspace pawl again engages the rack, and the same movements shown in figures 4 and 5 will continue to repeat.

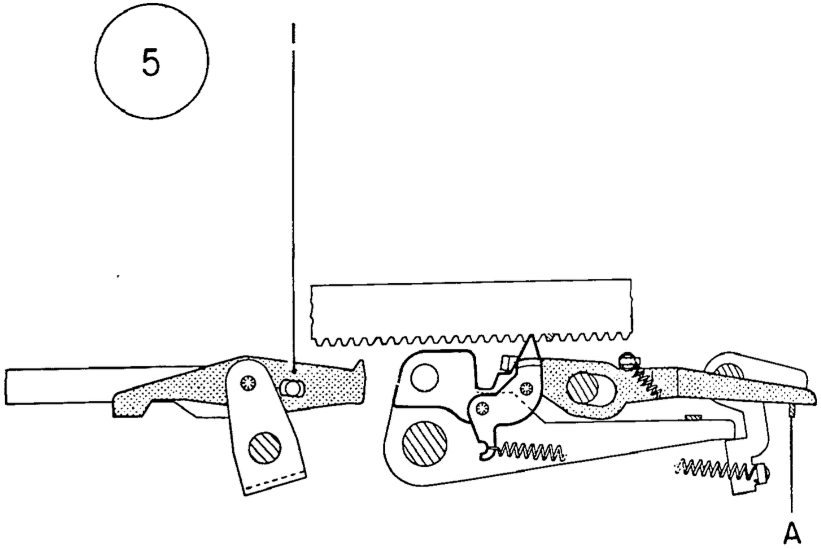
③



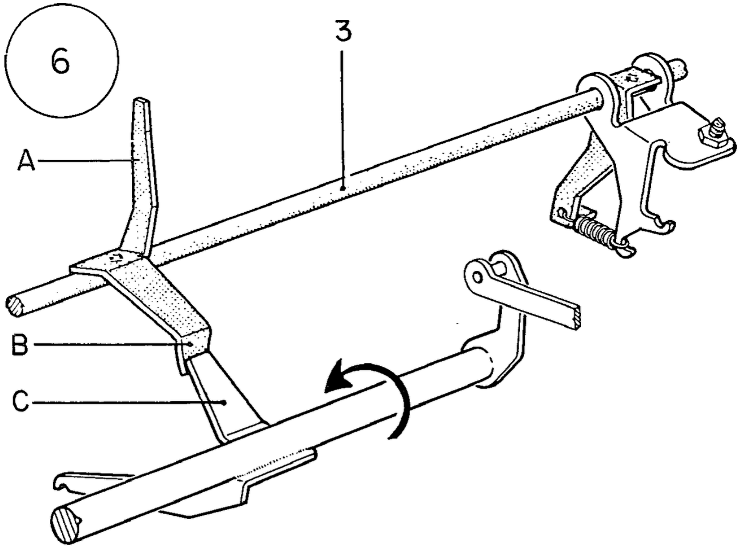
④



⑤



⑥

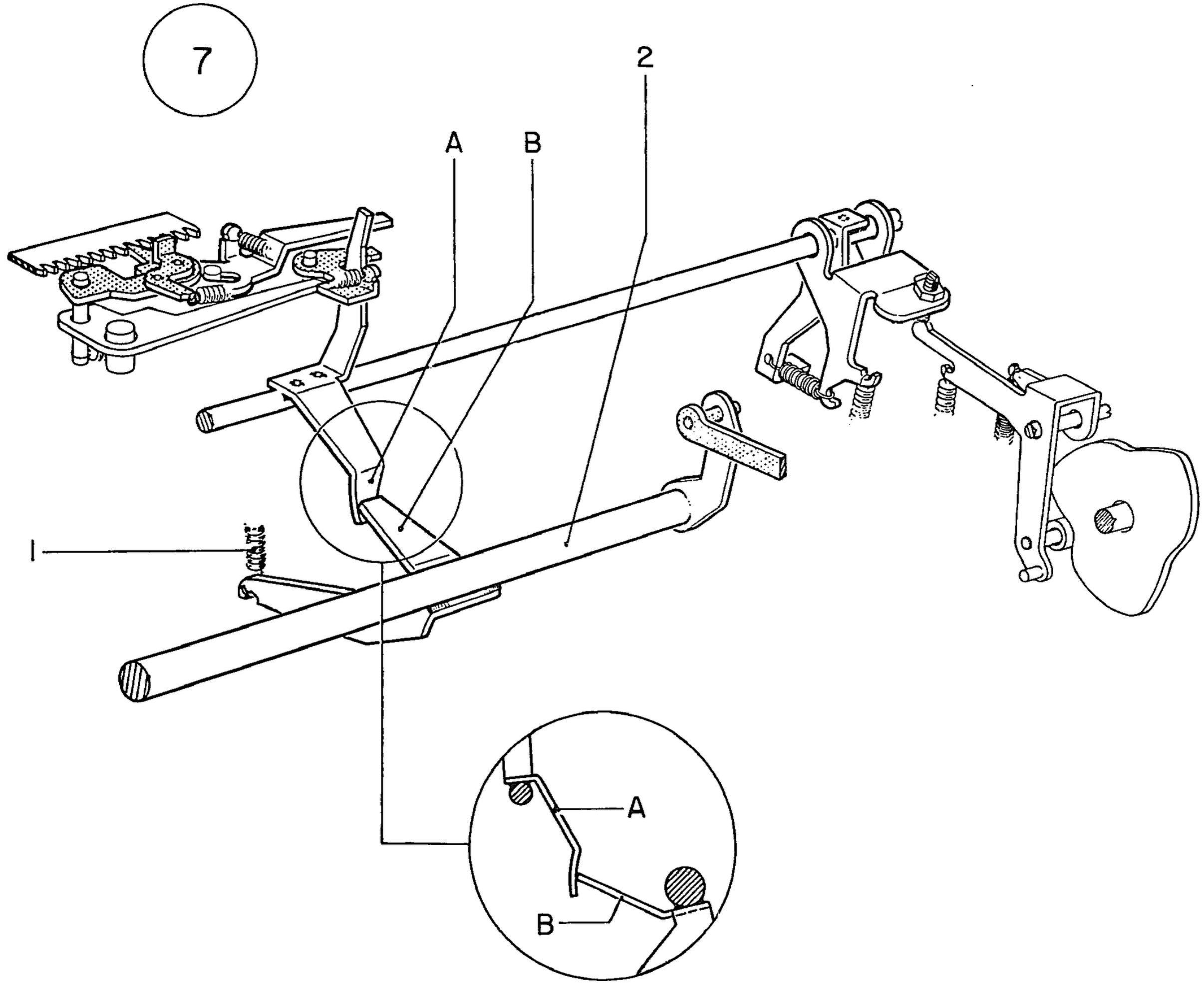


ESCAPEMENT TRIP EXCLUSION ADJUSTMENT

With the back space key depressed, and the power shaft turned until the reset frame shaft (2) reaches maximum rotation, the finger (B) must just slightly contact the finger (A), as shown in the inset drawing.

> Note. The contact between the fingers (A and B) must be slight to ensure that the shaft (2) can return to rest under the tension of spring (1).

Adjust the contact between the fingers by forming the lower portion of finger (A), as required.

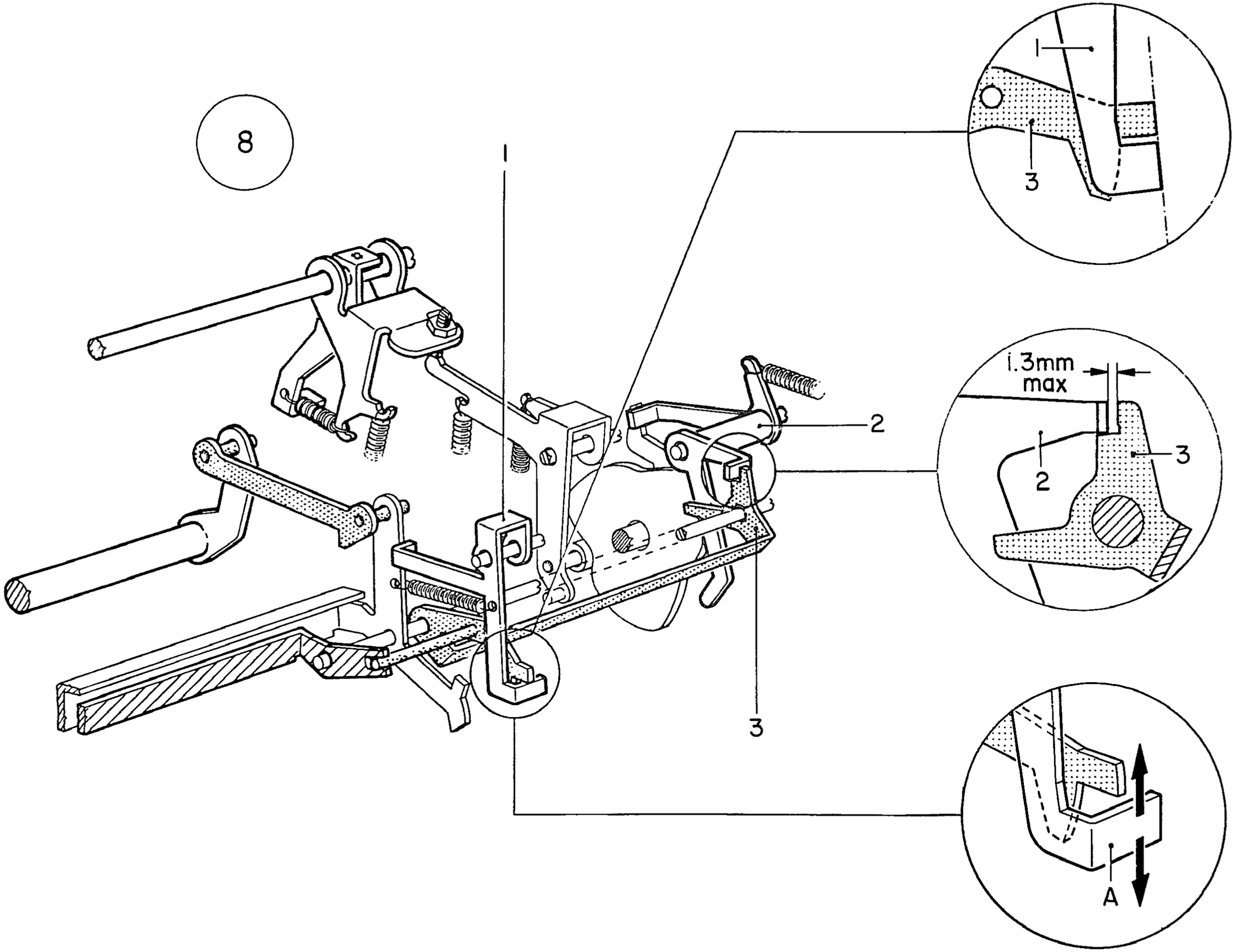

7
2
A
B
I
A
B

PRINT CAM INTERLOCK LEVER ADJUSTMENT

The purpose of this adjustment is to ensure that the printing cycle does not start until the backspace cycle is nearly completed.

- Depress the back space key and turn the power shaft until the interlock lever (1) assumes the position shown in the upper inset.
- Depress a character key and check that the print cam activating bail extension (3) maintains a hold on the starting lever (2) with a maximum gap of 1.3 mm (as shown in center inset).

To adjust for proper gap, form the wing (A) of the interlock lever (1) up or down, as required. (Refer to the lower inset.)


1.3mm max
A

SECTION 21

MARGINS
AND
ASSOCIATED MECHANISMS

INTRODUCTION TO MARGINS AND ASSOCIATED MECHANISMS

Both left and right margin stops are attached to the margin stop rack. The position of the margin stops can be changed from the keyboard by using the appropriate keys.

The left margin stop establishes the start of the writing.

The right margin stop controls:

- The bell, which alerts the operator that the end of the writing line is approaching.
- The end of the writing line, by engaging the line lock mechanism.

Both margin stops can be by-passed through the use of the margin by-pass key without changing the position of the margin stops.

The maximum travel of the carriage is determined by the carriage limit stops (1 and 5).

MARGIN STOPS AND RACK ASSEMBLY

The margin stop rack (3) is attached to the carriage frame. The margin stop rack supports and maintains the margin stops (2 and 4) in position.

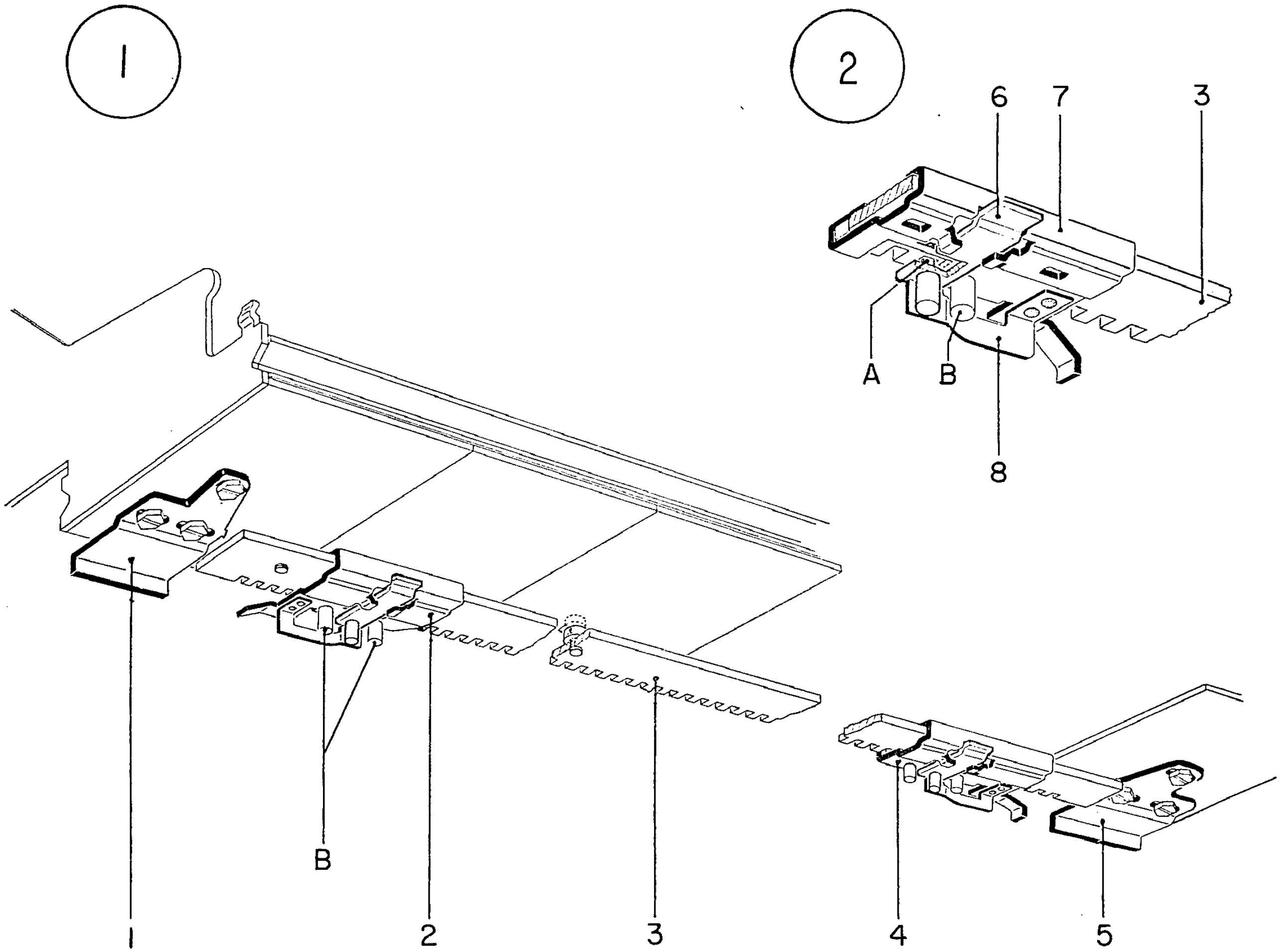
Figure 2 illustrates the assembly of the right margin stop.

The component parts of the margin stop are:

- Margin stop housing (7).
- Margin stop plunger (6) with locating pin (A) which holds the margin stop in position.
- Spring (8).
- Detaining pins (B). (Only one is shown in figure 2.)

To reposition either margin stop requires:

- Disengagement of the locating pin (A) from the margin rack (3).
- Relocation of the margin stop rack in respect to the margin stop.
- Re-engagement of the locating pin (A) at the new position in the margin stop rack.


①
②
A
B
B

MARGIN CONTROL PLATE ASSEMBLY

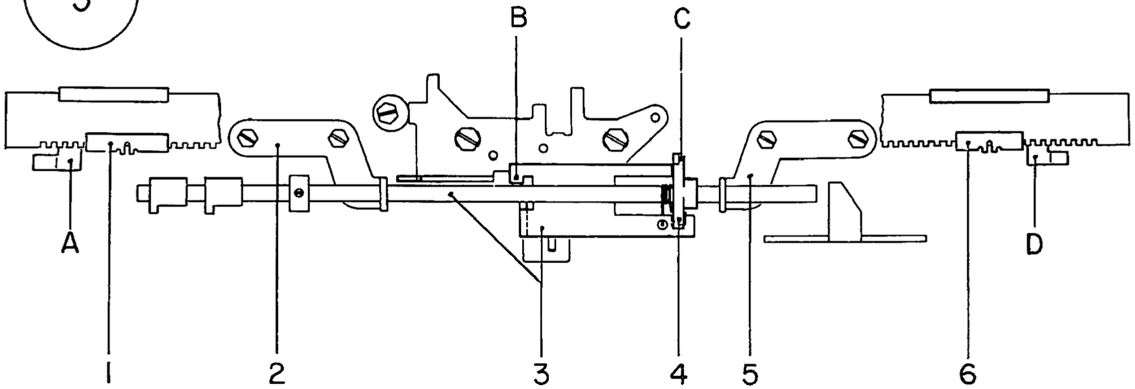
The margin control plate assembly, in conjunction with either the margin stops or the limit stops, controls the amount of travel of the carriage. The left margin stop determines the start of the writing line; the right margin stop determines the end of the writing line. The margin by-pass key actuates the margin control plate to enable the carriage to by-pass either margin stop.

ASSEMBLY (REST POSITION)

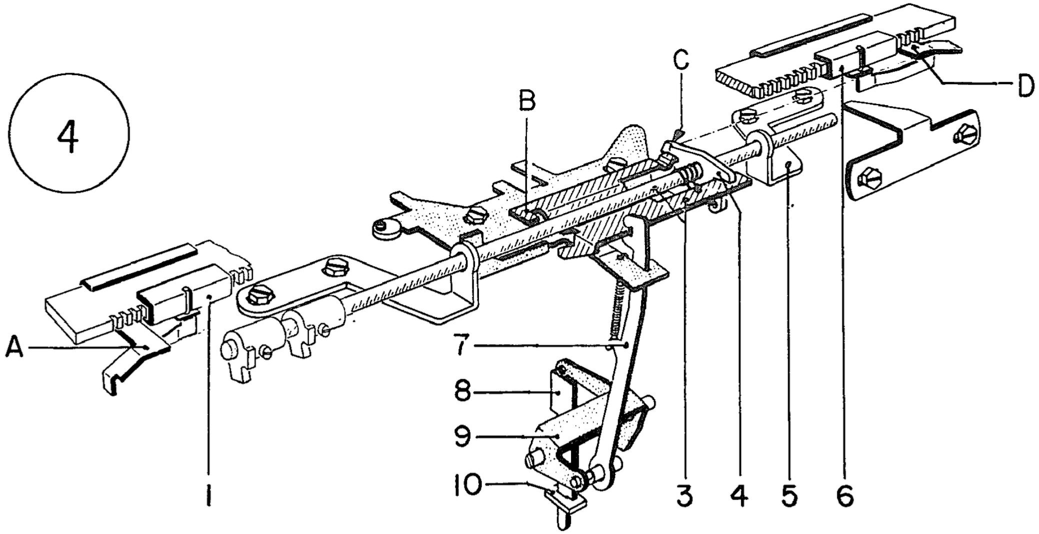
The margin control plate assembly (3) is attached to the machine by the two brackets (2 and 5). The angular rest position of the margin control plate is established through the arm (7), the control bridge (9), and the plunger (8) resting on the guide plate (10).

The start of the writing line is established when the wing (D) of the left margin stop (6) limits against the banking stop (4) as at (C). Conversely, the end of the writing line is reached when the wing (A) of the right margin stop (1) limits against the extension (B) of the margin control plate (3).

③



④



LEFT MARGIN STOP (BANKING POSITION)

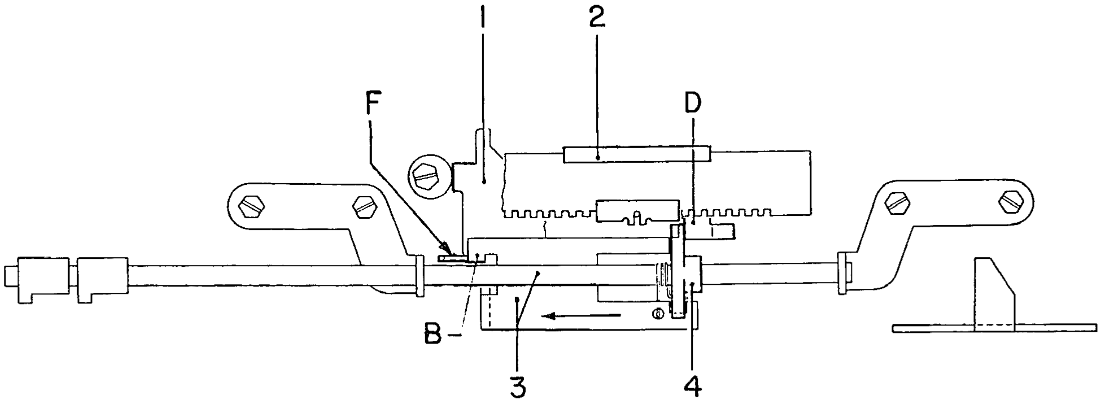
The return of the carriage to the left margin stop is known as banking, and when limited by the left margin the carriage is at the banked position. The carriage is normally returned to the banked position with the carriage return key.

During a carriage return operation, the wing (D) of the left margin stop (2) contacts the banking stop (4). The margin control plate (3) moves in the direction of the arrow, figure 5, until stopped by the extension (B) of the margin control plate (3) limiting against the stop (F) of the service plate (1). The service plate is attached to the fixed rail assembly. This movement of the margin control plate also actuates the air-cylinder mechanism which cushions the impact of the carriage as it reaches the banked position.

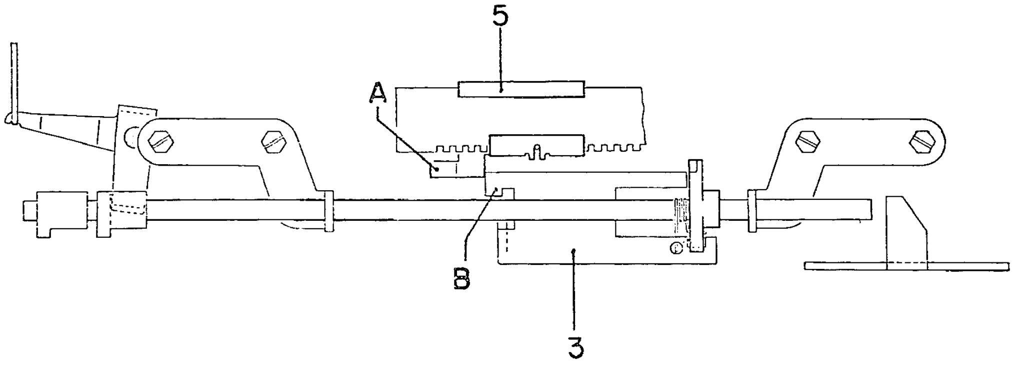
RIGHT MARGIN STOP

Two spaces before the carriage reaches the end of the writing line, the wing (A) of the right margin stop (5) contacts extension (B) of the margin control plate (3), figure 6.

Subsequent movement of the carriage to the left will move the margin control plate (3) in the direction of the arrow, figure 7. This movement will cause the collar (7), which is attached to the margin control plate shaft, to rotate the crank (6), and actuate the line lock mechanism.



⑤



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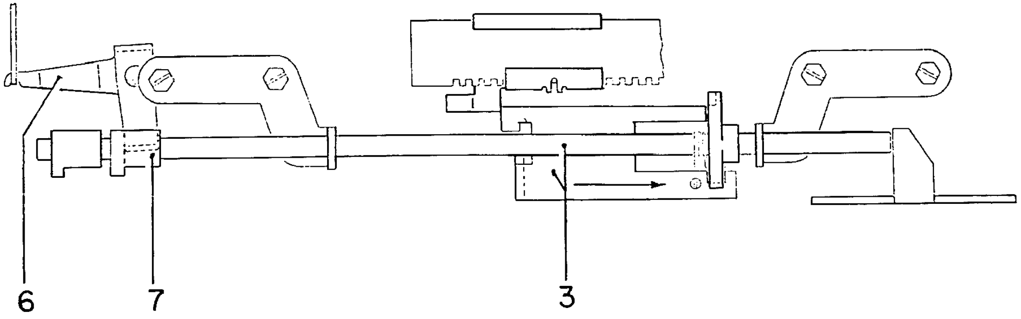


⑦

MARGIN STOP SETTING

The positioning of the margin stops is controlled from the keyboard. To relocate the position of the margin stop:

- Move the carriage to the margin stop that is to be moved.
- Hold the margin set key depressed while positioning the carriage to the new point at which the margin stop is to be located.
- Release the margin set key. The margin stop will now be set at the new position.

When the carriage is positioned against the margin stop that is to be moved and the margin set key is depressed, the margin stop is automatically disengaged from the margin stop rack. The margin stop also is held in a fixed position while the carriage is moved to its new location.

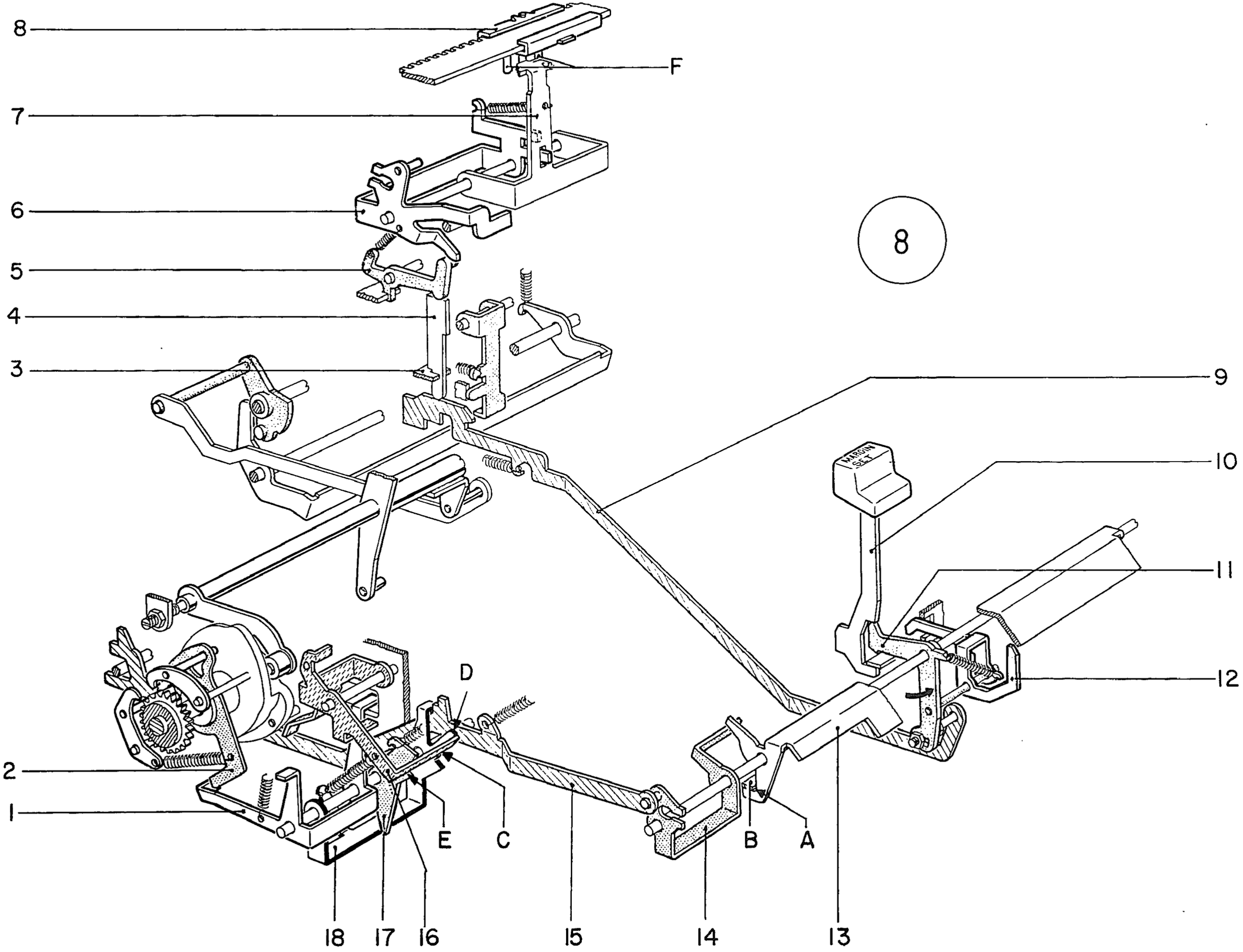
When the margin set key is released, the margin stop re-engages with the margin stop rack at the new position of the carriage.

ASSEMBLY (REST POSITION)

The position of the margin stop setting finger (7) is determined by the control bridge (6), and the intermediate arm (5) resting on the plunger (4). The plunger, in turn, rests on the guide plate (3). In this position the setting finger (7) is out of the path of the pins (F) of the margin stop (8).

The rest position of the activating link (9) is established, through the crank (11), by the margin set key stem (10) resting against the rubber stop on the keyboard. Mounted on the stud of the crank (11) is the release lever (12) which rests on the bottom of a slot in the keyboard housing.

The foot (A) of the service cam activating bail (13), resting against the rubber stop (B), establishes the rest position for the bail (13), the command bridge (14), and the trip link (15). The arm (D) of the intermediate bridge (18) is held by the wing (C) of the block-out arm control lever (16) which, in turn, rests on the step (E) of the trip latch (17). The flange (2) is held by the starting lever (1), and the service cam clutch is disengaged. These mechanisms are held in their rest position by their respective springs.


F
MARGIN SET
D
C
E
B
A

ACTIVATION

To reposition a margin stop, the setting finger (8) must move in the direction of the arrow to release the margin stop from the rack. This is accomplished by a service cycle, during which the setting finger engages and holds the margin stop stationary until the carriage has been relocated to the desired position.

When the margin set key is depressed the key stem (11) rotates the crank (13), causing the following two movements to occur:

- The step (A) of the activating link (16) is brought forward into the path of the universal bar (5), and the inclined surface (B) of the activating link contacts, and rotates, the latch (10).
- The release lever (12) rotates the service cam activating bail (14) in the direction of the arrow.

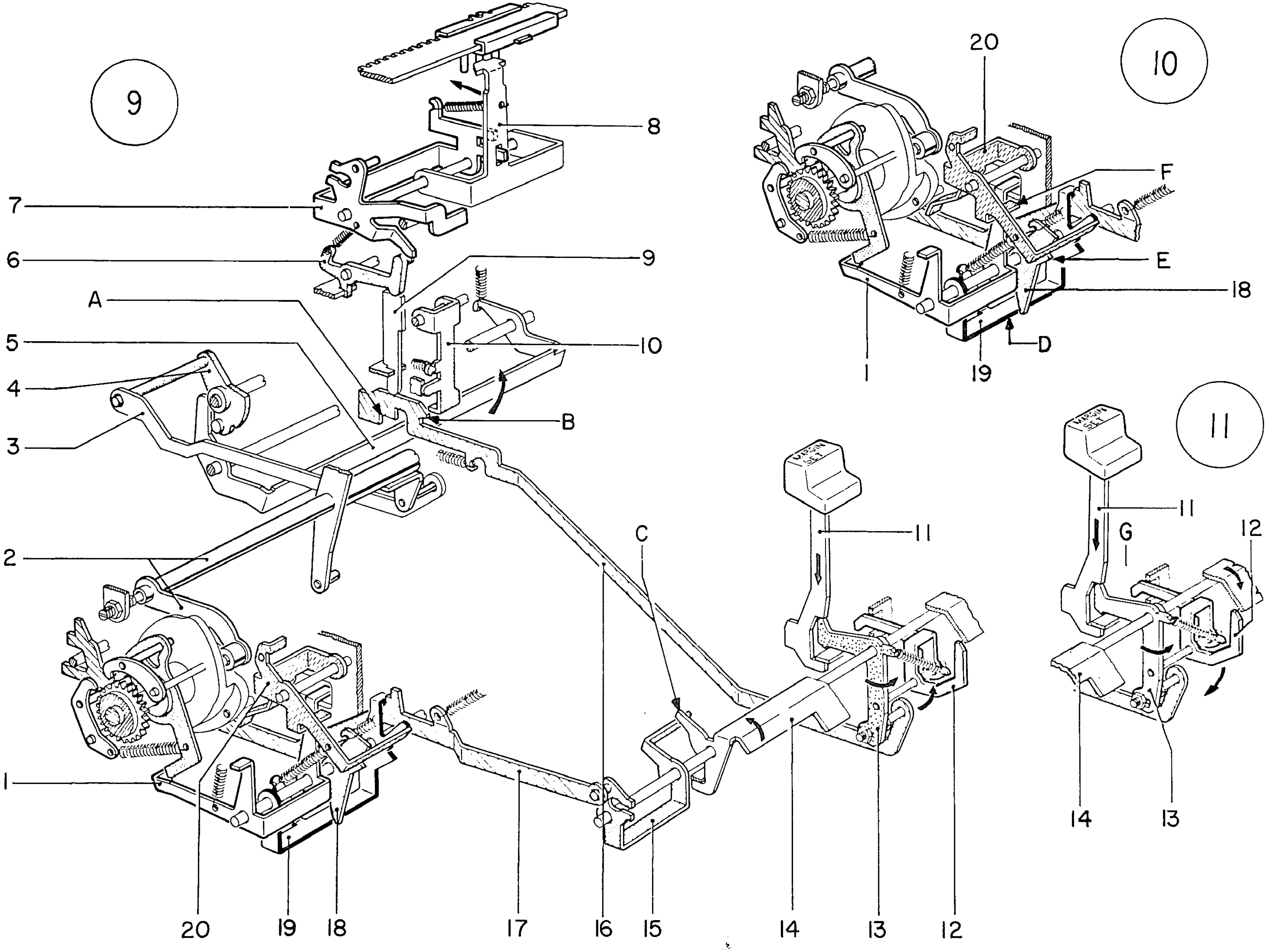
The rotation of the service cam activating bail (14), through its extension (C), rotates the command bridge (15), which moves the trip link (17) rearward and rotates the intermediate bridge (19). The beam D (figure 10) of the intermediate bridge (19), in turn, rotates the trip latch (18), causing the step (E) to release its hold on the block-out arm control lever (20). Through the action of its spring, the control lever (20) rotates, and its wing (F), in turn, rotates the starting lever (1). Consequently, the clutch is engaged, and the service cam can rotate.

When the margin set key is depressed, the parts (14, 15 and 17) must immediately return to rest even though the margin set key is held depressed. This is necessary when a combination of two service cycles are required, such as margin set and tabulation. This is accomplished in the following manner (see figure 11): When the margin set key stem (11) rotates the crank (13), it causes the release lever (12) to rotate the activating bail (14), starting the service cycle. The initial rotation of the release lever (12) causes the inclined surface (G) to contact the bottom of the slot in the keyboard housing. The continuing rotation of the crank (13) then causes the inclined surface (G) to ride up on the bottom of the slot, and reverse the direction of rotation of the release lever (12). The release lever, in reversing its direction of rotation, releases its hold on the service cam activating bail (14), allowing the activating bail and trip link (17) to return to rest.

During the service cycle, the service cam rotates the reset frame shaft (2), which, through the drive link (3) and rocker (4), rotates the universal bar (5), in the direction of the arrow (figure 9). The universal bar (5) contacts step (A) and raises the rear of the activating link (16) which, through the plunger (9), intermediate arm (6), and control bridge (7), rotates the margin set finger (8) by means of the coupling spring.

As the universal bar raises the rear of the activating link (16), the latch (10), through the action of its spring, holds the rear of the actuating link in the raised position until the margin set key is released.

When moving the carriage while the margin set key is depressed, the margin stop rack slides freely in the margin stop. After the carriage is in the desired position and the margin set key is released, the activating link (16) restores rearward through the tension of its spring. This rearward movement of the activating link (16) releases it from the latch (10), and allows the margin set finger and its associated parts to restore to their rest positions.


A
B
C
F
E
D
G
MARGIN SET
MARGIN SET

MOVEMENT OF RIGHT MARGIN STOP

The figures show a rear view movement of the right margin stop during a margin-setting operation.

Figure 12 shows the carriage positioned at the right margin, ready for a margin-setting operation. The right margin stop (2) has moved the margin control plate and shaft (3) to the left, and the collar (1) has actuated the line lock mechanism.

When the margin set key is depressed, the margin setting finger (4) must move rearward, and engage between the detaining pins (A and B) of the margin stop (2). At the same time, the setting finger moves the pin (C) of the plunger rearward, disengaging the plunger pin from the rack.

Figure 13 shows the margin setting finger (4) at rest, and the plunger pin (C) is in the rack, with the shaded tooth to the left of the plunger pin.

In figure 14 the margin setting finger has begun to move rearward, and has pushed the plunger pin (C) out of the rack. The shaded tooth of the rack is still to the left of the plunger pin. It should be noted at this point that the setting finger (4) does not enter centrally between the detaining pins (A and B). The figure shows that while the setting finger has just contacted the detaining pin (A), there is a clearance between the setting finger and the detaining pin (B).

Figure 15 shows that as the margin setting finger (4) completes its rearward movement, it moves the right margin stop (as indicated by the arrow) approximately half a space. The plunger pin (C) is now located almost in line with the tip of the shaded tooth.

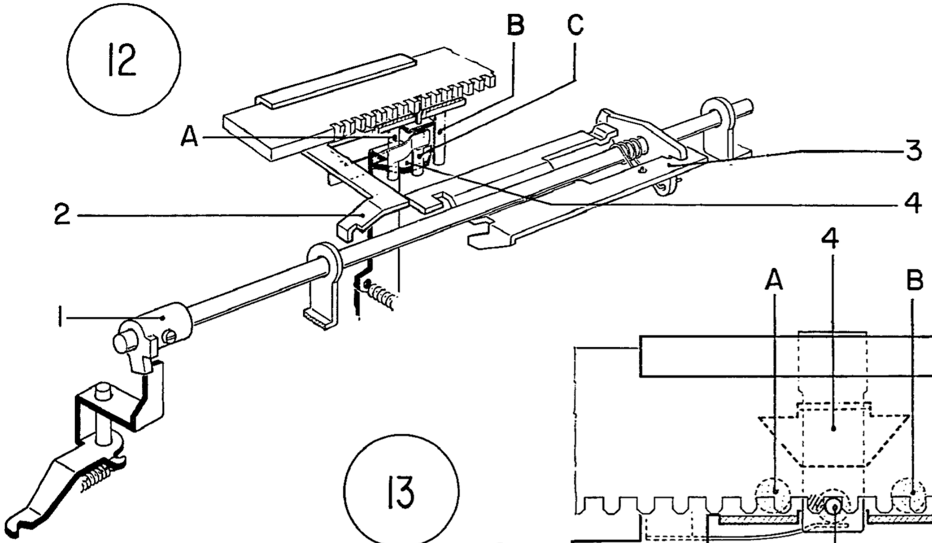
Figure 16 shows that the margin set key has been released, the margin setting finger (4) has restored to rest, and the plunger pin (C) has re-entered the rack. As the setting finger restored from between the detaining pins (A and B), the tension of the line lock mechanism springs was transmitted through the margin control plate (3) (note direction of arrow) to the right margin stop (2). This action pushed the margin stop (2) toward the left (rear view), and caused the plunger pin (C) to locate one tooth to the left of its original position. (The margin stop actually moved one space to the right, if viewed from the front of the machine.)

Because of the foregoing action, when the operator sets the right margin stop at 80 on the carriage position scale, the margin stop actually locates at 81. When typing into the right margin, the last character prints at 79, and the carriage spaces to 80, and activates the line lock mechanism. The next character key depression results in a non-print cycle, the carriage spaces to 81 on the carriage position scale, and the keyboard is deactivated.

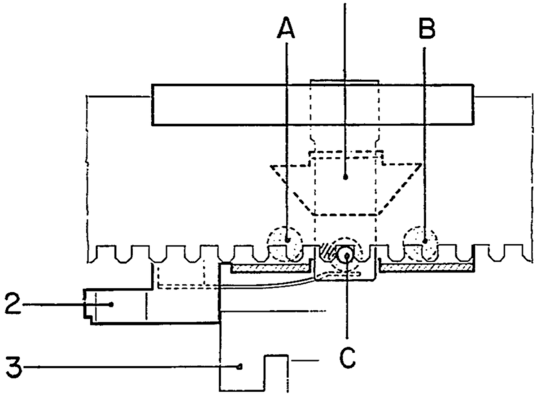
MOVEMENT OF LEFT MARGIN STOP

The action of the margin setting finger is the same when setting the left margin stop as when setting the right margin stop. That is, the left margin stop is moved approximately a half space to the right as was the right margin stop (viewing the machine from the front). However, when the margin setting finger releases the left margin stop, the stop will, in this case, move back to the left. This movement occurs through the action of the activated air-cylinder mechanism, thus counteracting the initial movement toward the right of the margin stop. The plunger pin, consequently, engages the tooth of the rack corresponding to the position at which the carriage is located on the carriage position scale, assuring a constant and positive setting of the left margin stop.

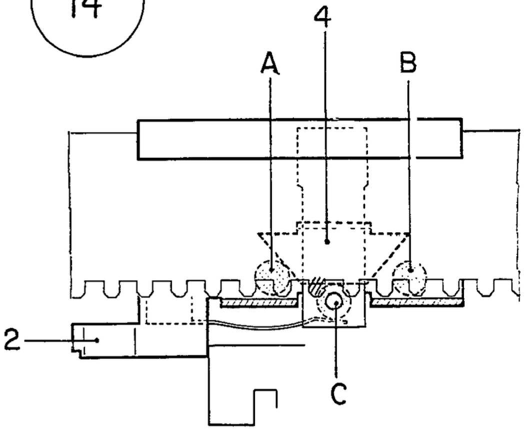
12



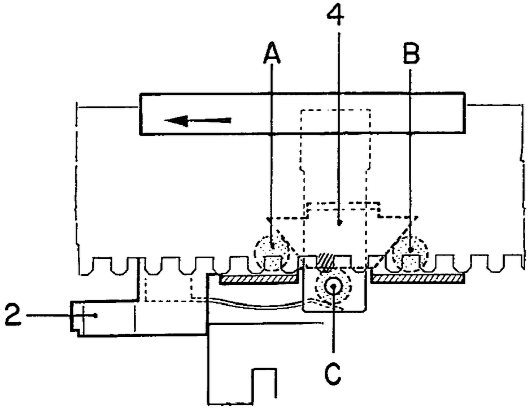
13



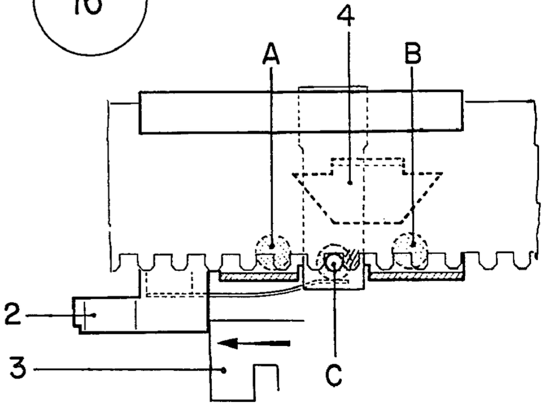
14



15



16



LINE LOCK MECHANISM

The end of the writing line is determined by the right margin stop which, during the last printing or spacing cycle, engages the line lock. The engagement of the line lock presets the stopping of printing, but does not deactivate the keyboard at this time. The subsequent condition of the keyboard (activated or deactivated) depends on whether a printing or spacing cycle follows the engagement of the line lock.

In the printing cycle, depression of a character key, after the line lock has been engaged, results in:

- A non-print cycle.
- One space advance of the carriage.
- Keyboard deactivation through the "input control latch."

In the spacing cycle, depression of the space bar after the line lock has been engaged, results in:

- One space advance of the carriage.
- The keyboard remaining activated.

When the subsequent cycle following engagement of the line lock is a printing cycle, the keyboard is deactivated, and no further printing or spacing cycles are obtainable until the keyboard is reactivated. When the cycle following engagement of the line lock is a spacing cycle, the keyboard remains operative. In either case, if only one cycle occurs following line lock engagement, the carriage advances one space and is still held by the escapement dog.

In the condition where the keyboard remains operative, initiation of another printing or spacing cycle disengages the escapement dog from the rack. The carriage will now move slightly to the left until the margin control plate reaches the limit of its travel. In this position the carriage is no longer held by the escapement dog.

At the end of the writing line, reactivation of the keyboard can be obtained through the following keyboard actions:

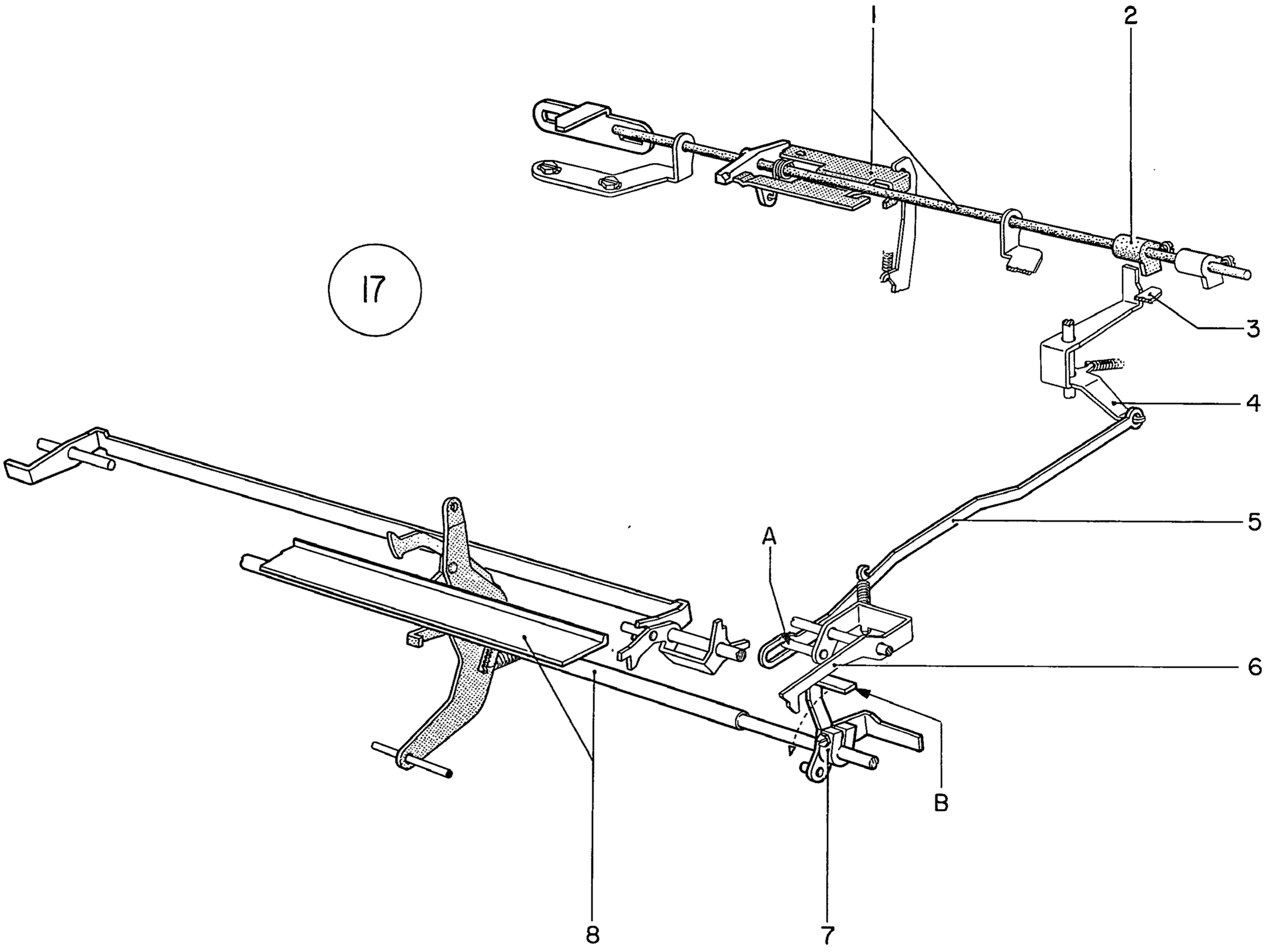
- Margin by-pass, to extend the length of the writing line.
- Carriage return, to establish the start of the next writing line.

ASSEMBLY (REST POSITION)

Figure 17 shows the line lock mechanism in rest position.

The line lock hook (6) rests, through spring action, with its stud (A) at the rear of the slot in the link (5). In this position the hook is clear of the path of the wing (B) of the clamp (7) on the type-action bail (8). The link (5) is attached to the crank (4), which rest against the stop (3) and just clears the collar (2) of the margin control plate shaft (1).

When the line lock is engaged, the hook (6) must intercept the wing (B), and prevent the full rotation of the type-action bail (8).


A
B

ACTIVATION

As the carriage spaces during the last printing cycle, the wing (A) of the right margin stop moves the margin control plate and shaft (2) toward the left. This movement causes the collar (3) to rotate the crank (4), pulling the link (5) rearward. The rearward movement of the link, through the connecting spring (6), rotates the hook (7) down into the path of the wing (B) of the clamp (8).

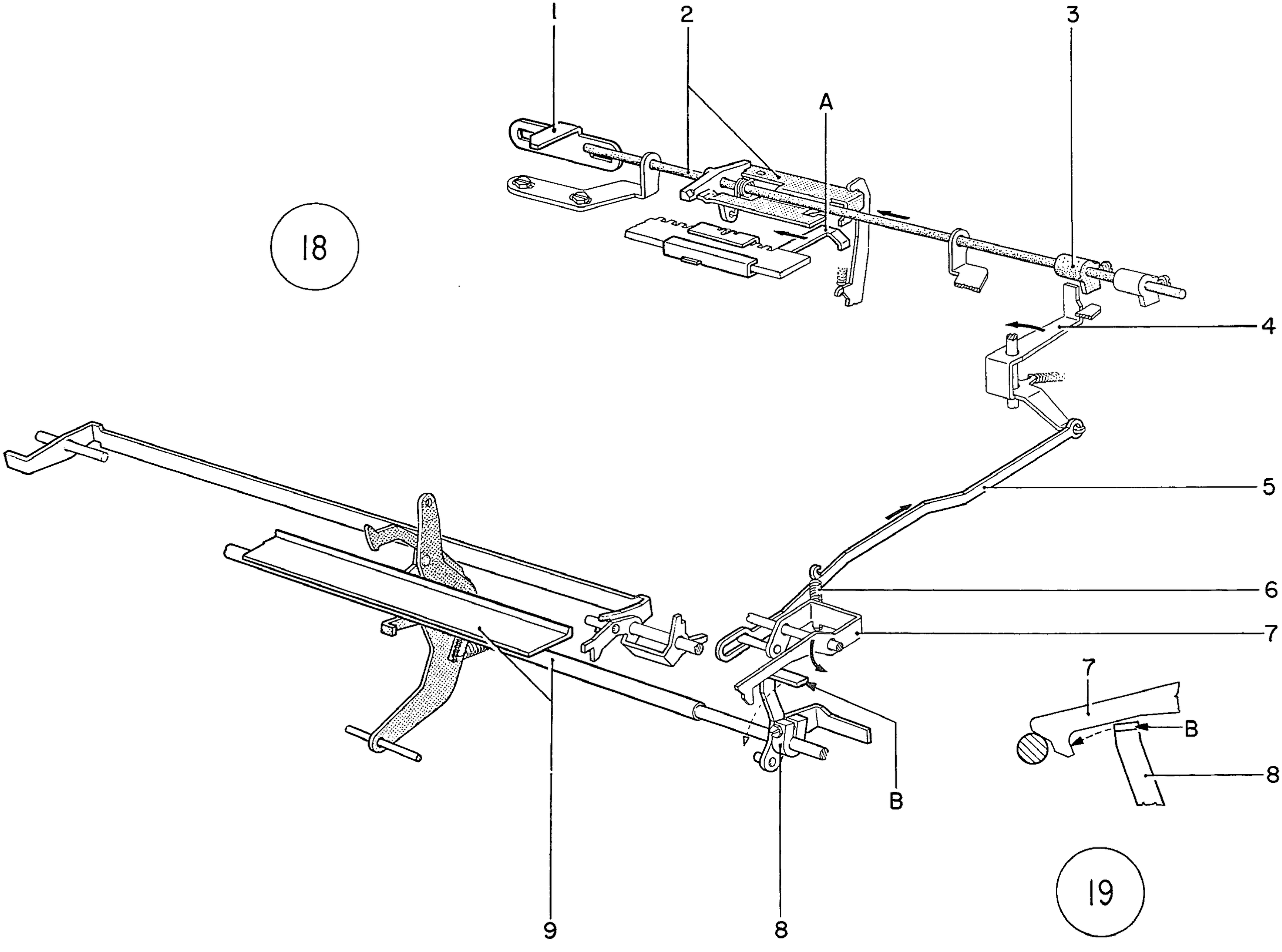
When the line lock hook (7) is positioned in the path of wing (B), as shown in figure 19, the type-action bail (9) will not be able to perform its full rotation on the next printing cycle. Consequently, when a character key is depressed, a normal printing cycle will occur with the exception that the type bar will not strike the platen.

In the above case, the carriage will still move one space when either a character key or the space bar is operated. If a printing cycle is now performed, the machine will be in the following condition at the end of the cycle:

- The carriage has spaced without printing.
- The pull link is released.
- The input control latch is holding the print cam starting lever.

This results in the keyboard being deactivated and the carriage still being held by the escapement dog.

If instead of the printing cycle, a spacing cycle is performed after the last printing cycle, the carriage will move one space, but the keyboard will not be deactivated. A further cycle can then be operated which would disengage the escapement dog from the rack, and the carriage would move slightly to the left. The amount of movement to the left is determined by the margin control plate and shaft (2) limiting against the stop (1). This movement is less than one space, therefore, the carriage will no longer be held by the escapement dog.



18

19

MARGIN BY-PASS

The margin by-pass key is used whenever the operator wishes to type beyond the established positions of the margin stops. Depression of the margin by-pass key causes the margin control plate and the banking stop to rotate above, and out of the path of, the wing of the respective margin stop and, at the same time, activates a backspace cycle. The carriage can then be moved to the desired position beyond the established margin.

BY-PASSING THE LEFT MARGIN STOP

When the carriage is at the left margin, depression of the margin by-pass key will release the margin control plate from the margin stop and also backspace the carriage one space. The carriage can now be moved additional spaces to the right by use of the back space key, carriage return key, or manually.

BY-PASSING THE RIGHT MARGIN STOP

During typing, when the right margin is reached, the machine is in one of the following conditions:

- The keyboard is deactivated and the carriage is held by the escapement dog.
- The keyboard is either operative or deactivated, with the carriage held by the margin control plate limit stop.

In the first condition, the last character key depression resulted in:

- A non-print cycle.
- Keyboard deactivation.
- The carriage advancing one space.

Depression of the margin by-pass key in this condition causes the following action:

- Release of the margin control plate from contact with the margin stop.
- Reactivation of the keyboard.
- Backspacing of the carriage.

The operator can then continue typing with the characters correctly spaced.

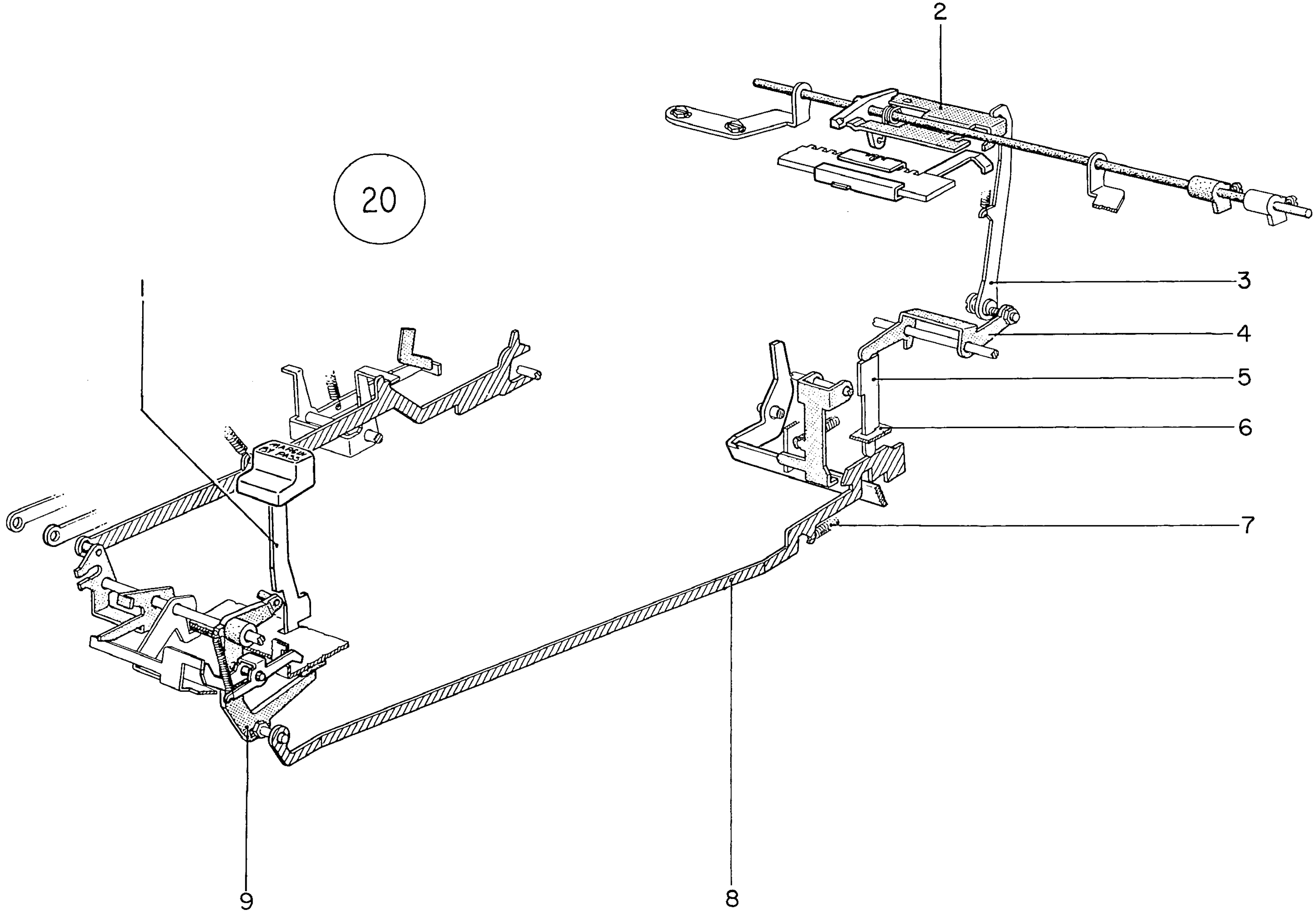
In the second condition given above, assume that the operator typed the last character of a word one space before reaching the line lock position, and then depressed the space bar. The carriage would move one space, and still be held by the escapement dog. (The keyboard, however, is still operative.) If at this time a character key is depressed, it will result in:

- A non-print cycle.
- Keyboard deactivation.
- The carriage moving a slight amount until stopped by the margin control plate limit stop, and is no longer held by the escapement dog.

Depression of the margin by-pass key will, for this second case, cause the following to occur:

- Release of the margin control plate from contact with the margin stop, thus allowing the carriage to move the balance of the space until held by the escapement dog.
- The carriage to backspace one space.
- Reactivation of the keyboard.

The operator can now continue typing beyond the right margin stop with the correct spacing between


MARGIN BY PASS

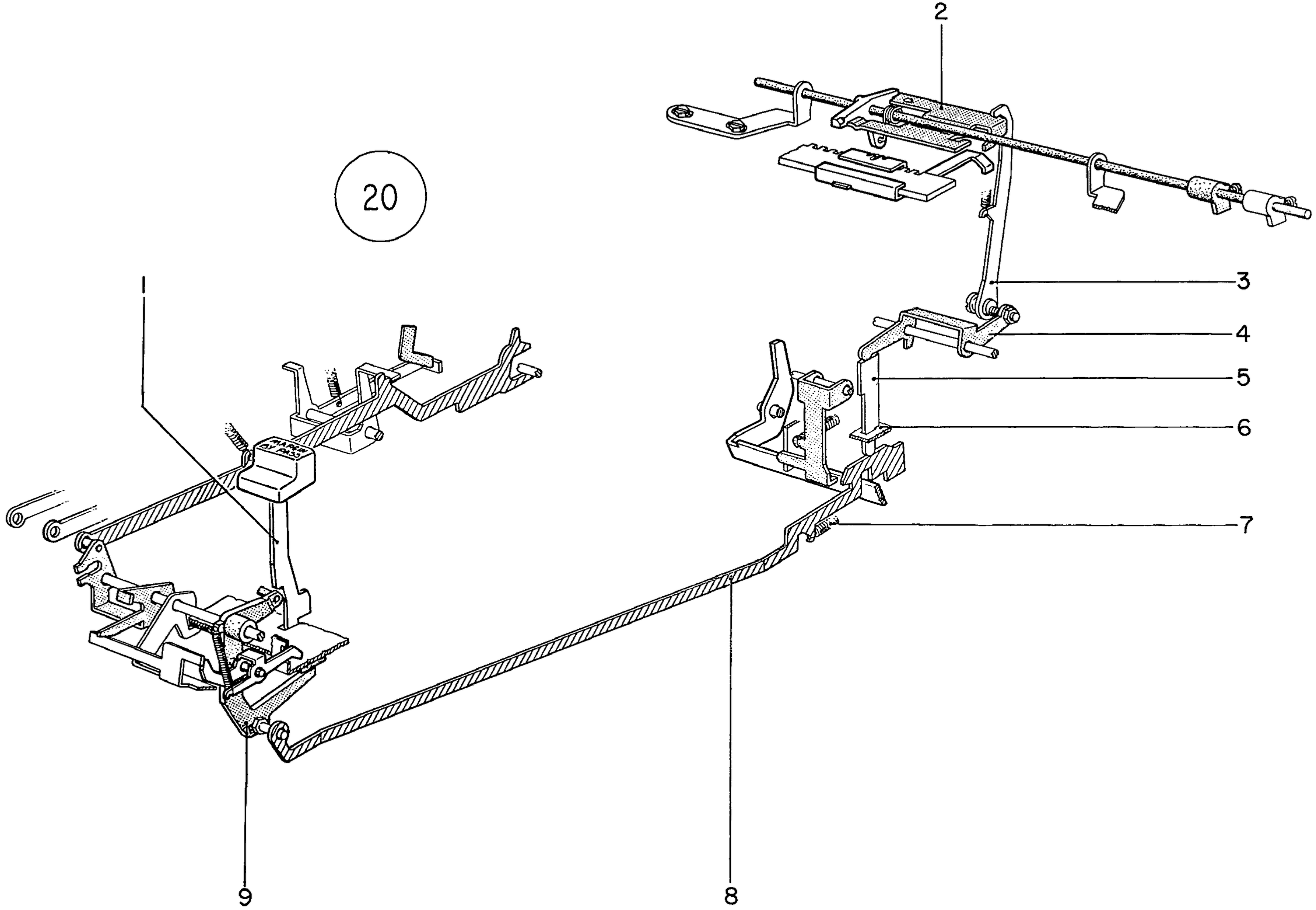
the words. The backspace cycle, in this case, counteracted the additional space that occurred because the carriage was not held by the escapement dog.

ASSEMBLY (REST POSITION)

The angular rest position of the margin control plate (2) is determined through the link (3) and bridge (4), and by the plunger (5) resting on the guide plate (6).

The activating link (8) is held to the rear by the spring (7) and is attached at the front to the crank (9), which is controlled by the margin by-pass key stem (1).

⑳



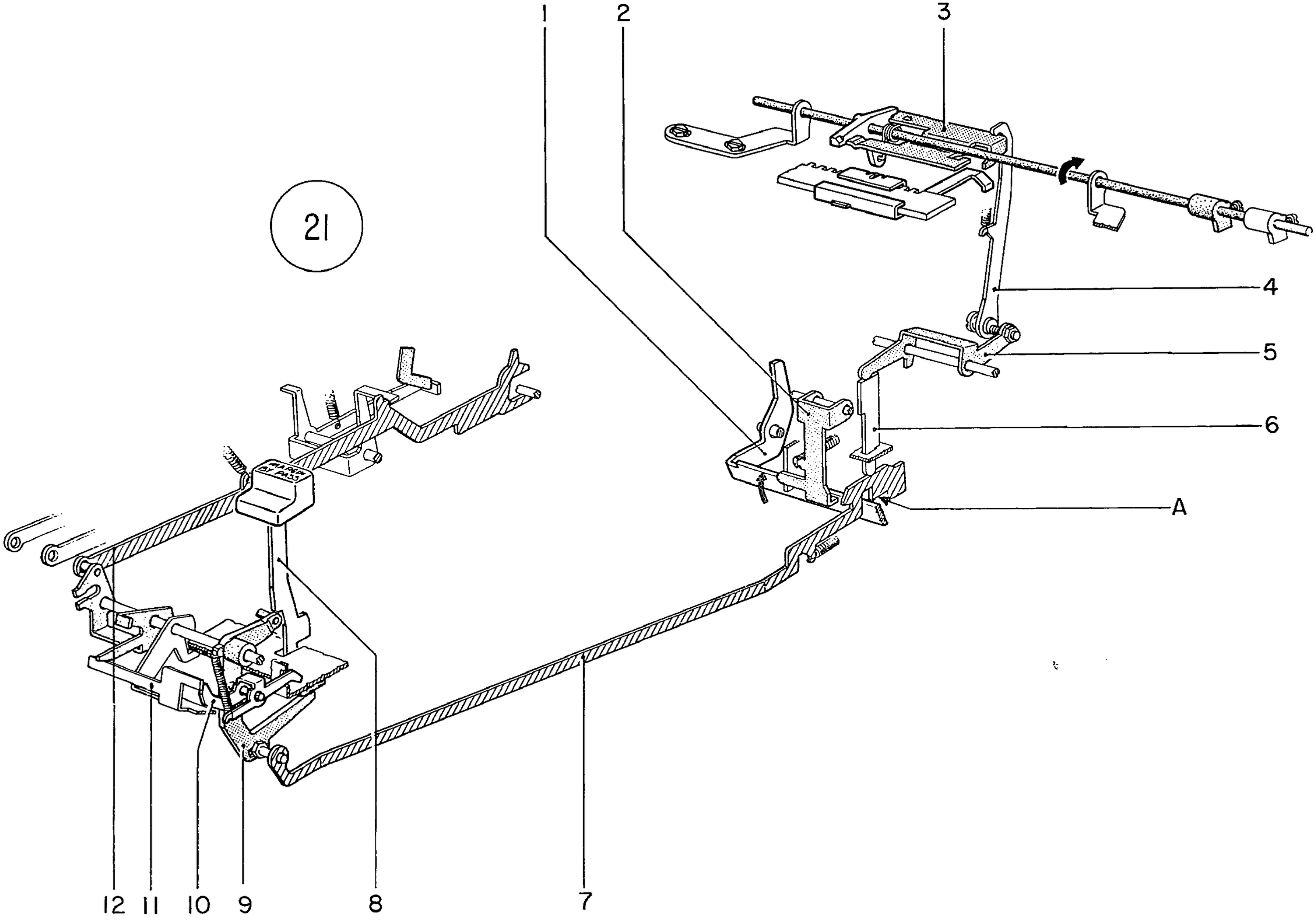
ACTIVATION

When the margin by-pass key is depressed, the key stem (8) rotates the crank (9). The rotation of the crank performs two functions. First, through the release lever (10), it rotates the command bail (11), which engages the service cam clutch in the same manner as during backspacing. The function of the release lever (10) is to allow the bail (11) and trip link (12) to immediately restore when the margin by-pass key is depressed, thus permitting a combination of two service cycles to take place, such as margin by-pass and carriage return. The second function of the rotation of the crank (9) is to pull the activating link (7) forward so that its step (A) is in the path of the universal bar (1).

During the service cycle, the universal bar (1) rotates (in the direction of the arrow), raising the activating link (7). This movement, through the plunger (6), bridge (5) and link (4), rotates the margin control plate (3) in the direction of the arrow, causing it to release its hold on the respective margin stop. The carriage can then be moved to the desired position beyond the margin stop.

When the activating link (7) was raised, the latch (2), through the action of its spring, engaged the activating link (7) and held it in the raised position. This action insured that the margin control plate will be held in the rotated position as long as the margin by-pass key is held depressed.

The margin control plate had initially been moved either to the left or right, depending on which margin stop had contacted it. When the margin control plate releases the respective margin stop, the control plate restores laterally over the top of the wing of the margin stop, through spring tension. Consequently, although the margin by-pass key is released before the carriage is moved, the margin control plate cannot immediately drop down and interfere with the movement of the carriage.


A

BELL

The purpose of the bell is to alert the operator that the carriage is approaching the end of the writing line.

ACTIVATION

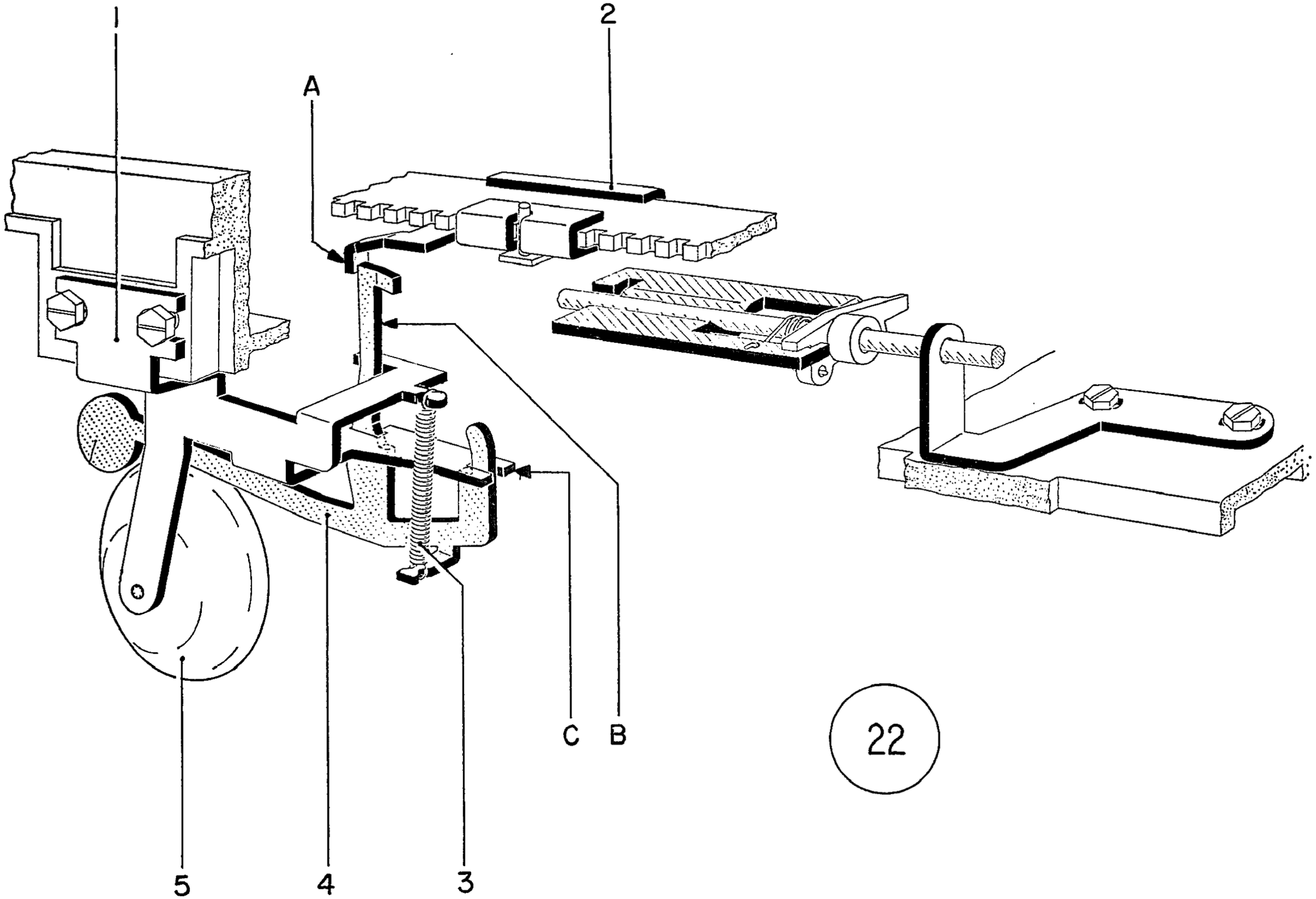
As the carriage moves to the left, the wing (A) of the right margin stop (2) contacts the arm (B) of the bell hammer (4). The continued movement of the carriage pivots the bell hammer until the wing (A) passes beyond the point at which it can maintain contact with the arm (B). The spring (3), having been stretched, then causes the bell hammer (4) to strike the bell (5).

ADJUSTMENT

The bell hammer bracket (1) can be laterally positioned to time the ringing of the bell.

At rest the bell hammer (4) must not touch the bell (5).

To adjust, form the bell hammer stop (C) to obtain a clearance between the bell hammer (4) and the bell (5) which will give the best quality ring.



22

ADJUSTMENTS

MARGIN STOP RACK POSITION ADJUSTMENT

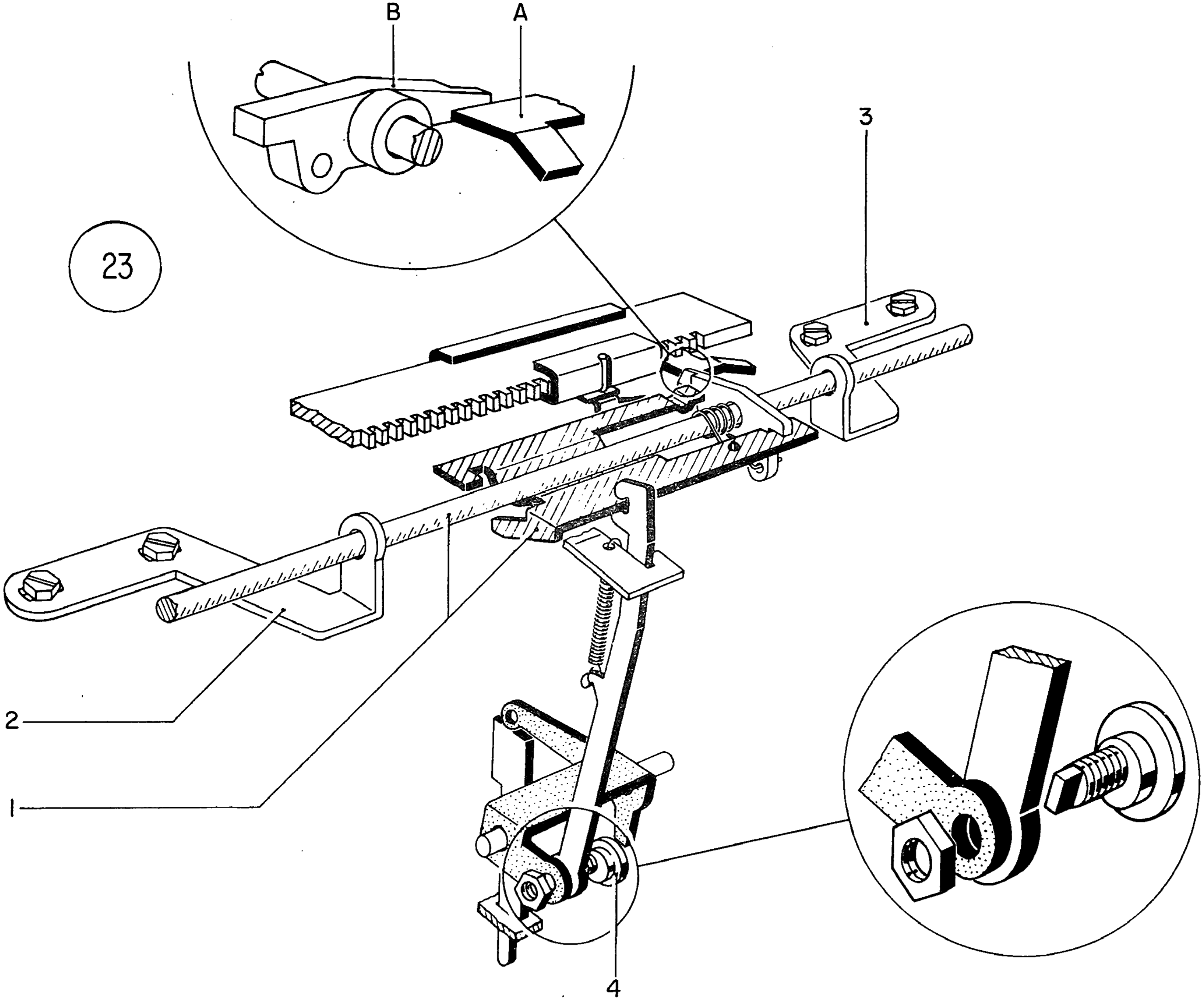
The position of the margin stop rack must be set in relation to the escapement rack and the carriage frame. If it is necessary to replace a rack, the exact dimensions for its position can be found in Section 29, page 406.

MARGIN CONTROL PLATE ADJUSTMENT

At rest position, the margin control plate must positively stop the carriage when contacted by the margin stops or limit stops.

Adjust the margin control plate as follows:

- Adjust the position of the brackets (2 and 3) so that the margin control plate shaft (1) is parallel with the carriage, and completely free.
- Adjust the eccentric (4) so that, at rest, the bottom of the banking stop (B) is flush with the underside of the margin stop wing (A). (Refer to upper inset.)


B
A

LEFT AND RIGHT LIMIT STOP ADJUSTMENT

When either the left or right margin stop is bypassed, the final travel of the carriage must stop at the respective limit stop, and be correctly positioned in relation to the carriage position scale.

Left Limit Stop Adjustment.

With the left margin stop (1) in the first notch of the margin stop rack, position the left limit stop (2) so that its edge (A) aligns with the wing (B) of the left margin stop as shown in figure 24.

Right Limit Stop.

For production reasons the margin rack has more teeth on the right than are required for machine operation. It is therefore necessary to establish the last position for the right margin stop by means of the right limit stop.

- Temporarily position the right limit stop so that its securing screws are centered in their respective slots.
- Bring the right margin stop against the limit stop. If necessary, move the right margin stop slightly to the left until the stop detents in the rack.
- Position the right limit stop so its wing aligns with the wing of the margin stop, as at A and B in figure 24.

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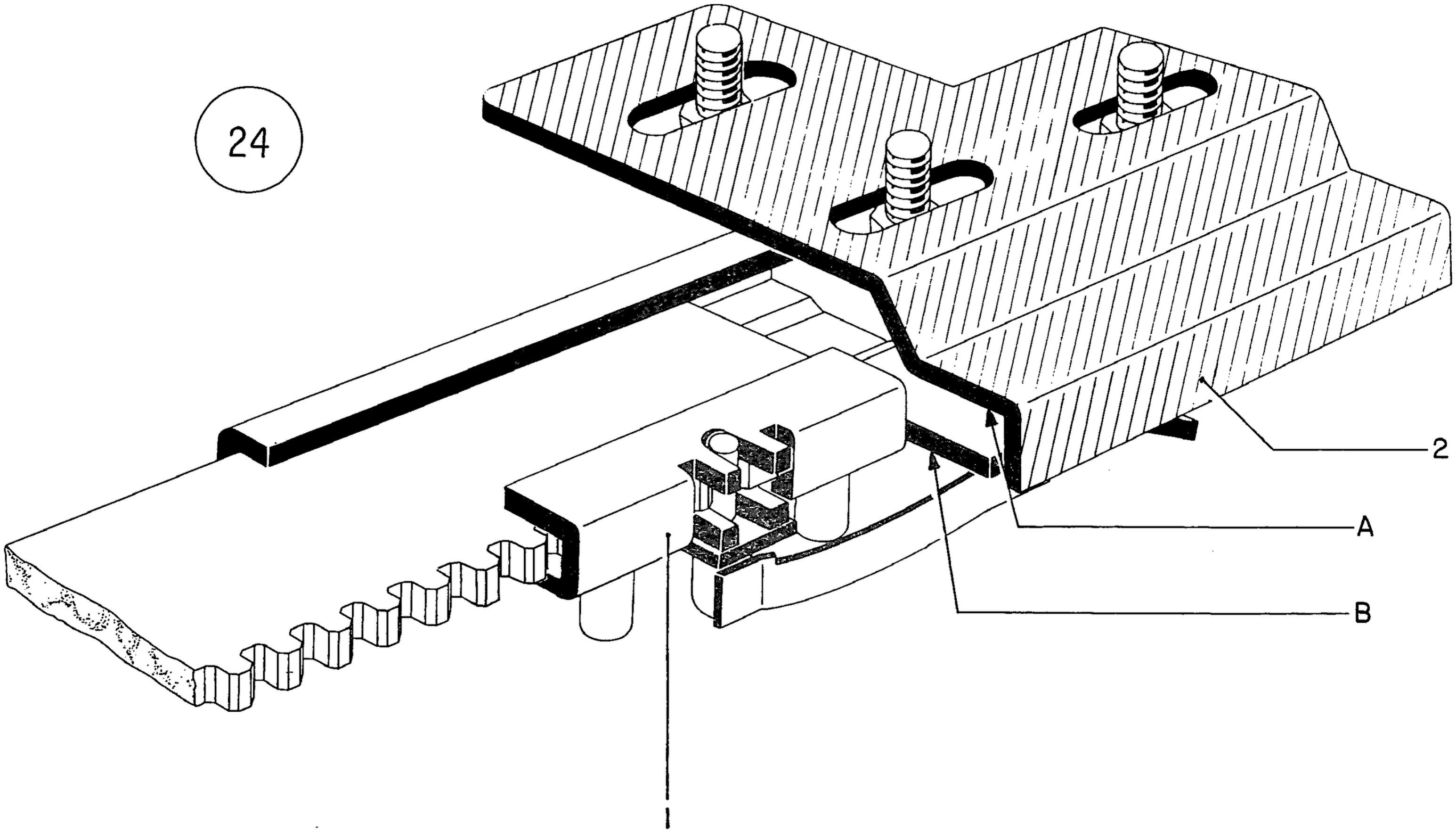
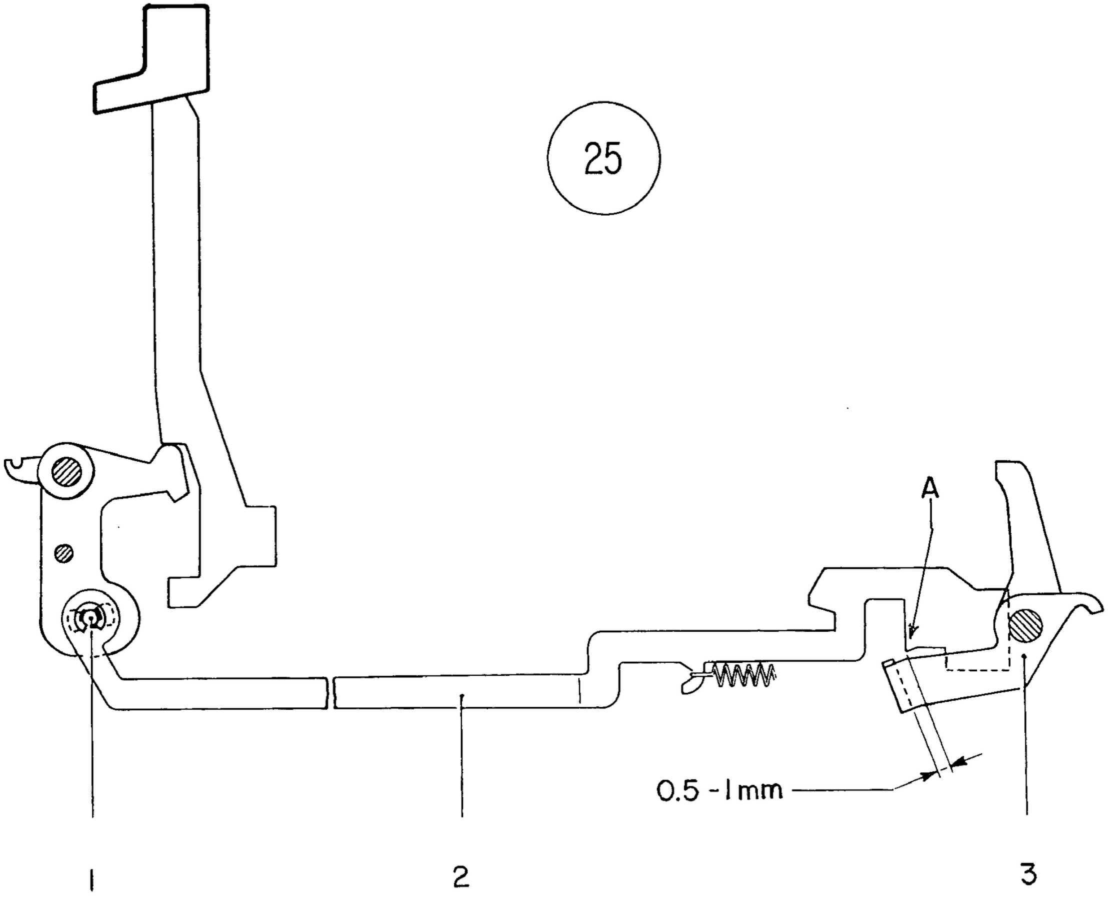


ACTIVATING LINKS ADJUSTMENT

At rest position, the step (A) of the margin set activating link (2) should clear the universal bar (3) with a clearance of 0.5 to 1 mm.

To adjust, regulate the coupling (1) as required.

Note. The activating links relative to the margin by-pass, tab set and tab clear keys are adjusted in the same manner and to the same specifications.


A
0.5 - 1 mm

SERVICE CAM ACTIVATING BAIL (REST POSITION) ADJUSTMENT

This adjustment is covered in the "Tabulation Section," page 354.

SERVICE CAM ACTIVATING BAIL TRIP LINK ADJUSTMENT

This adjustment is covered in the "Tabulation Section," page 354.

MARGIN SET KEY RELEASE LEVER ADJUSTMENT

When the margin set key is depressed, the release lever (3) must trip the service cam activating bail (4) and immediately allow the bail (4) and trip link (2) to restore. This permits another service cycle to take place (such as tabulation) in combination with the margin set operation.

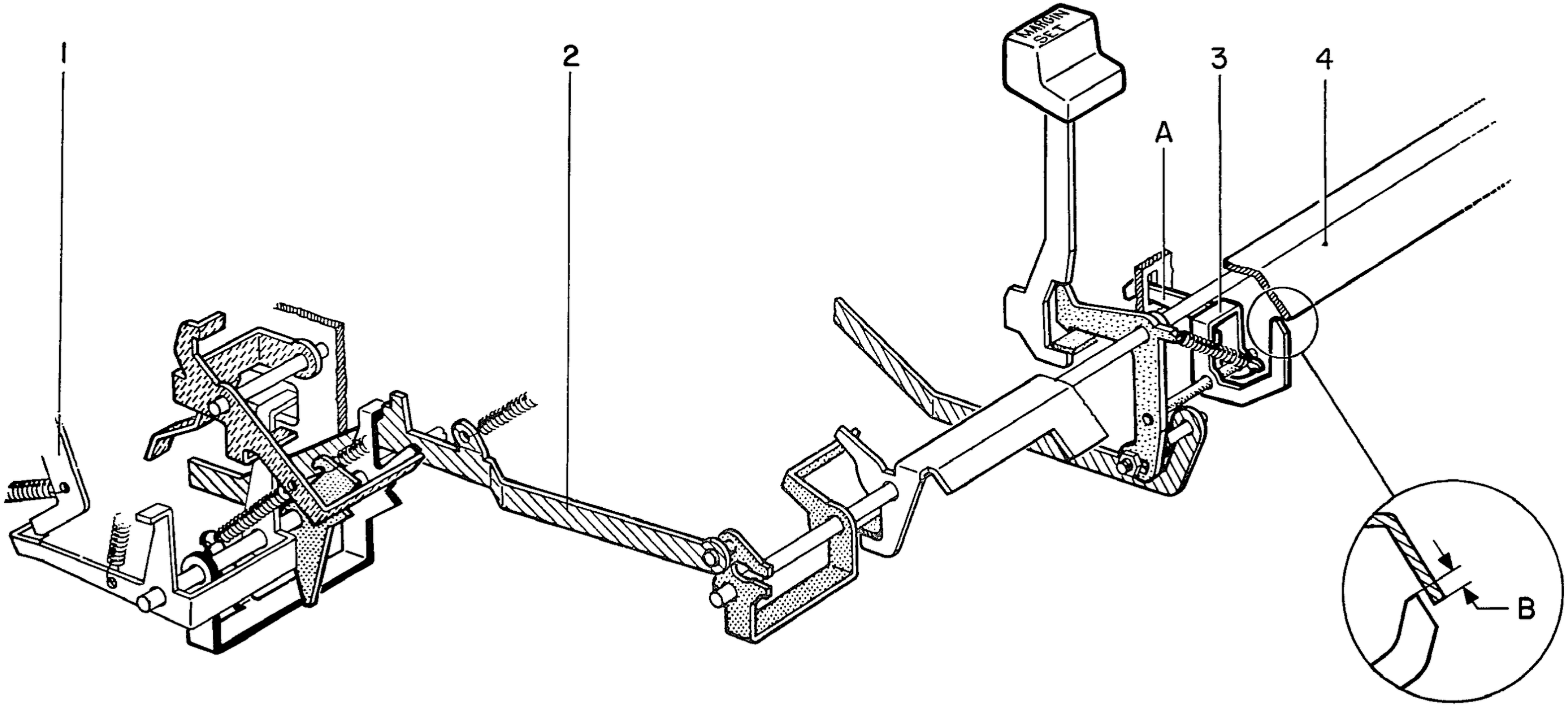
Check for the above conditions as follows:

- With the machine unplugged and at rest position, check that the arm (A) of the release lever (3) is resting against the bottom of the slot in the keyboard housing.
- Slowly depress the margin set key and check that the following three actions take place in the order listed:
  1. The starting lever releases the flange (1).
  2. The trip link (2) returns to rest.
  3. The margin set key still has a slight additional downward travel remaining.

Adjust as follows:

- If condition 1 above is not obtained, form the release lever (3) to increase the hold (B). Refer to lower inset.
- If conditions 2 and 3 above are not obtained, form the release lever (3) to decrease the hold (B).

26



BACKSPACE BLOCK-OUT ARM CONTROL LEVER RESTORE ADJUSTMENT

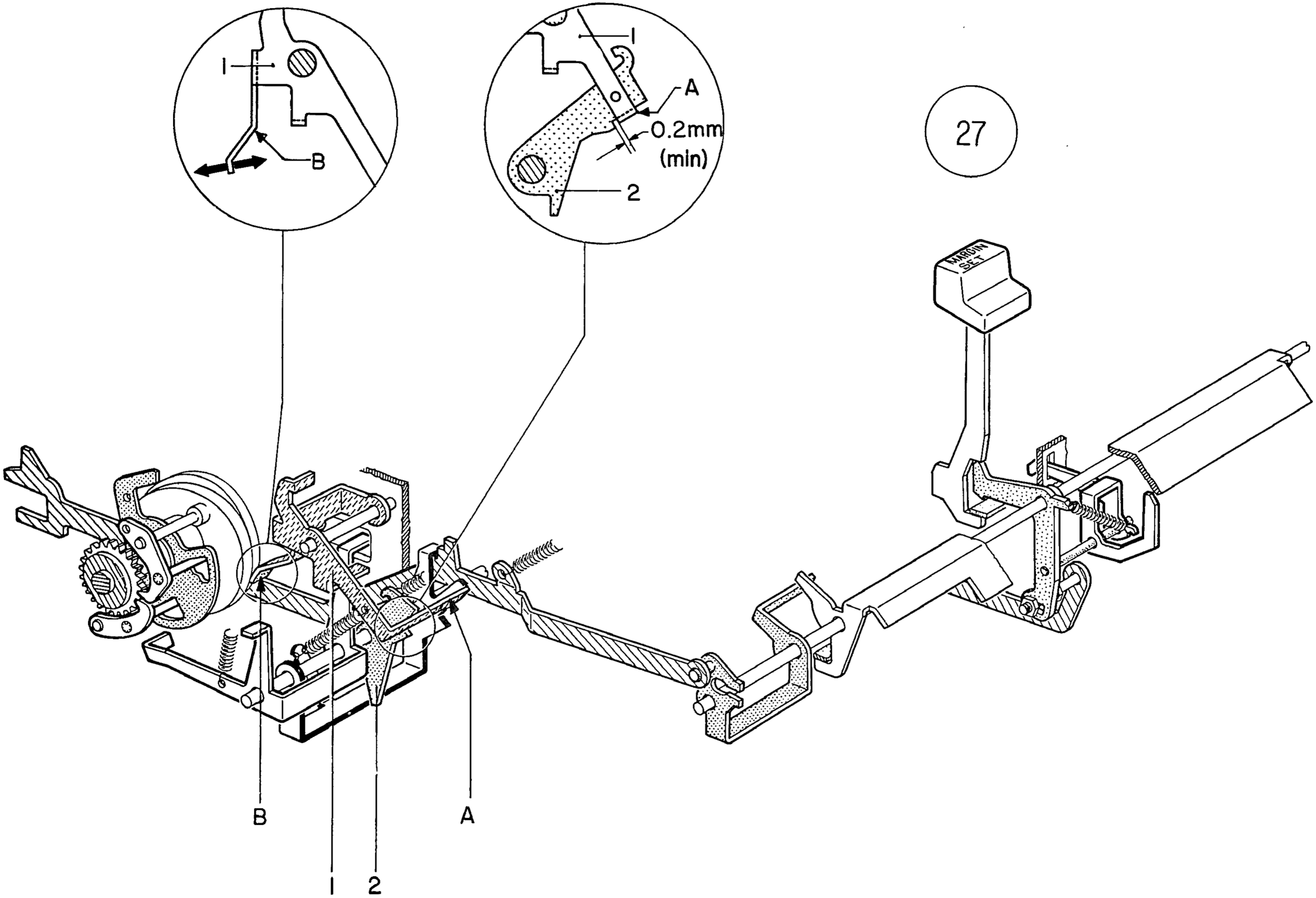
To ensure the disengagement of the service cam clutch, the backspace block-out arm control lever (1) must relatch at the completion of the cycle.

Check for the above condition as follows:

- With the machine unplugged and at rest position, depress and release the margin set key.
- Manually rotate the power shaft to the point of maximum restore of the block-out arm control lever (1).
- Check that in this position the wing (A) of the control lever (1) has travelled a minimum of 0.2 mm beyond the latching point of the trip latch (2), as shown in the upper right inset detail.

To adjust, form the arm (B) of the control lever (1), as indicated by the arrows in the upper left inset.

27



ADJUSTMENT OF CLEARANCE BETWEEN COMMAND BAIL AND MARGIN BY-PASS RELEASE LEVER

This adjustment ensures that the starting lever (1) will release the flange (2) to start a service cycle when the margin by-pass key is depressed.

Check for the above conditions as follows: With the machine at rest. and the arm (A) of the command bail (5) against the rubber stop (B). there must be a clearance of 0.2 to 0.5 mm between the extension (E) of the command bail (5) and the release lever (4). (Refer to the lower inset).

To adjust, proceed as follows:

- Check that the Back Space Trip Link Adjustment in Section 18 (page 194) is correct.
- Form the extension (E) of the command bail (5) to obtain the 0.2 to 0.5 mm clearance.

MARGIN BY-PASS RELEASE LEVER ADJUSTMENT

This adjustment ensures that the trip link (3) will return to rest position as the margin by-pass key is depressed. This is necessary to obtain another service cycle, such as carriage return, in combination with the margin by-pass operation.

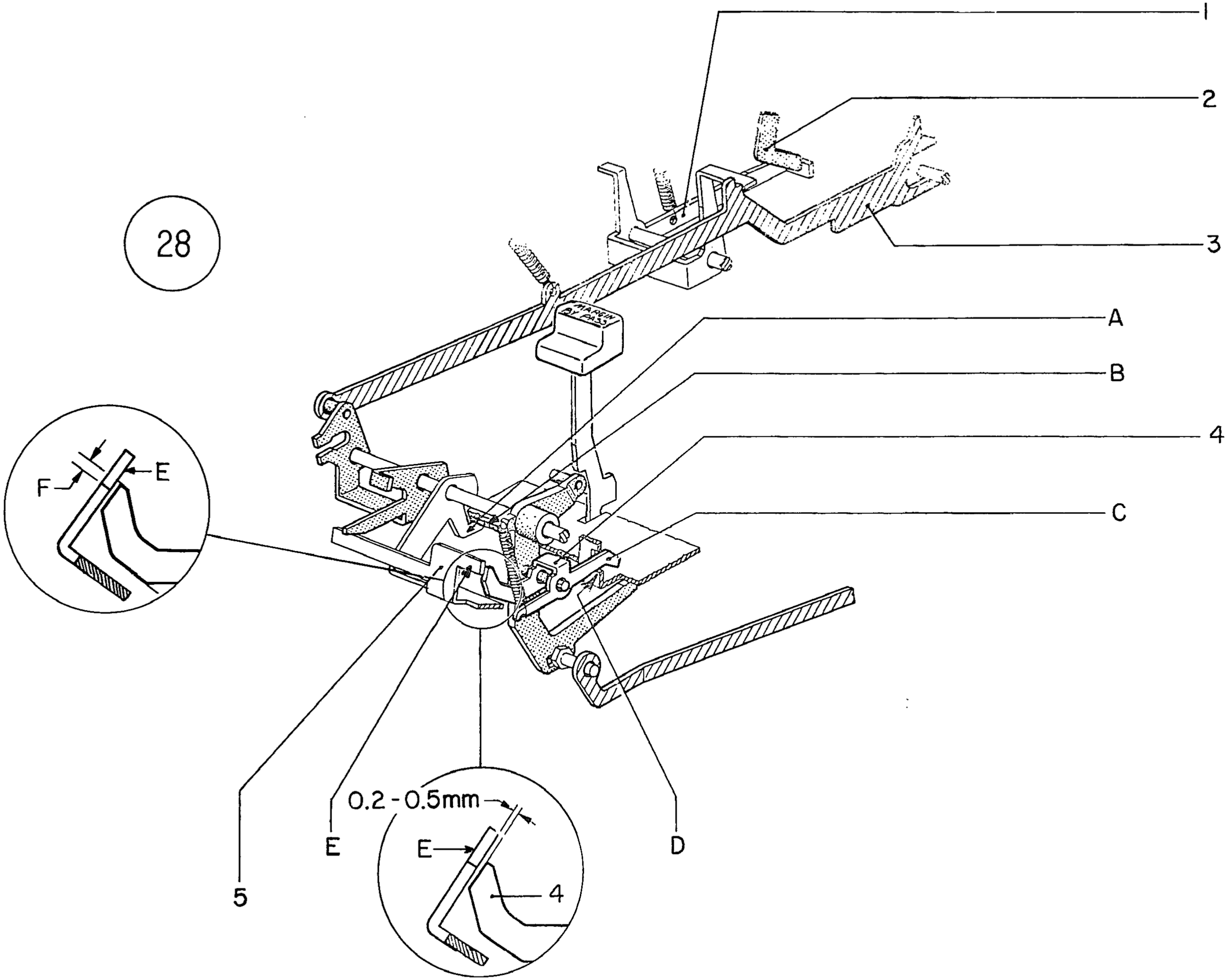
Check the above adjustment as follows:

- With the machine at rest, and the power cord unplugged, the arm (C) of the release lever (4) must be on the bottom of the slot in the keyboard frame as at (D).
- Slowly depress the margin by-pass key, and check that the following conditions occur in the order listed:
  1. The starting lever (1) releases the flange (2).
  2. The trip link (3) returns to rest.
  3. The margin by-pass key still has a slight additional downward travel remaining.

Adjust as follows:

If condition 1 above is not obtained, form the release lever (4) to increase the hold (F). (Refer to the left-hand inset.)

If condition 2 and 3 above are not obtained, form the release lever (4) to decrease the hold (F). (Refer to the left-hand inset.)


28
1
2
3
A
B
4
C
MARGIN BY PASS
F
E
5
E
0.2 - 0.5mm
E
4
D

LINE LOCK ADJUSTMENTS (Figure 29) & 30

When typing into the right margin, the line lock must engage and prevent the type-action bail from making its full rotation. The keyboard must deactivate, and there must be a slight additional movement remaining to the carriage after the non-print cycle. The two following adjustments will ensure that these conditions are obtained.

Line Lock Hook Adjustment.

Check for the above conditions as follows:

- Type into the right margin until the keyboard is deactivated by the line lock.
- Backspace twice.
- The line hook (3) should be clear of the wing (A) of the type-action bail clamp (4) (figure 29). With the machine in this position, manually hold the margin control plate (~~2~~)5 against the right margin stop. There should be a clearance of 0.1 to 0.5 mm between the line lock crank (1) and the collar (2). (Refer to the inset drawing.)

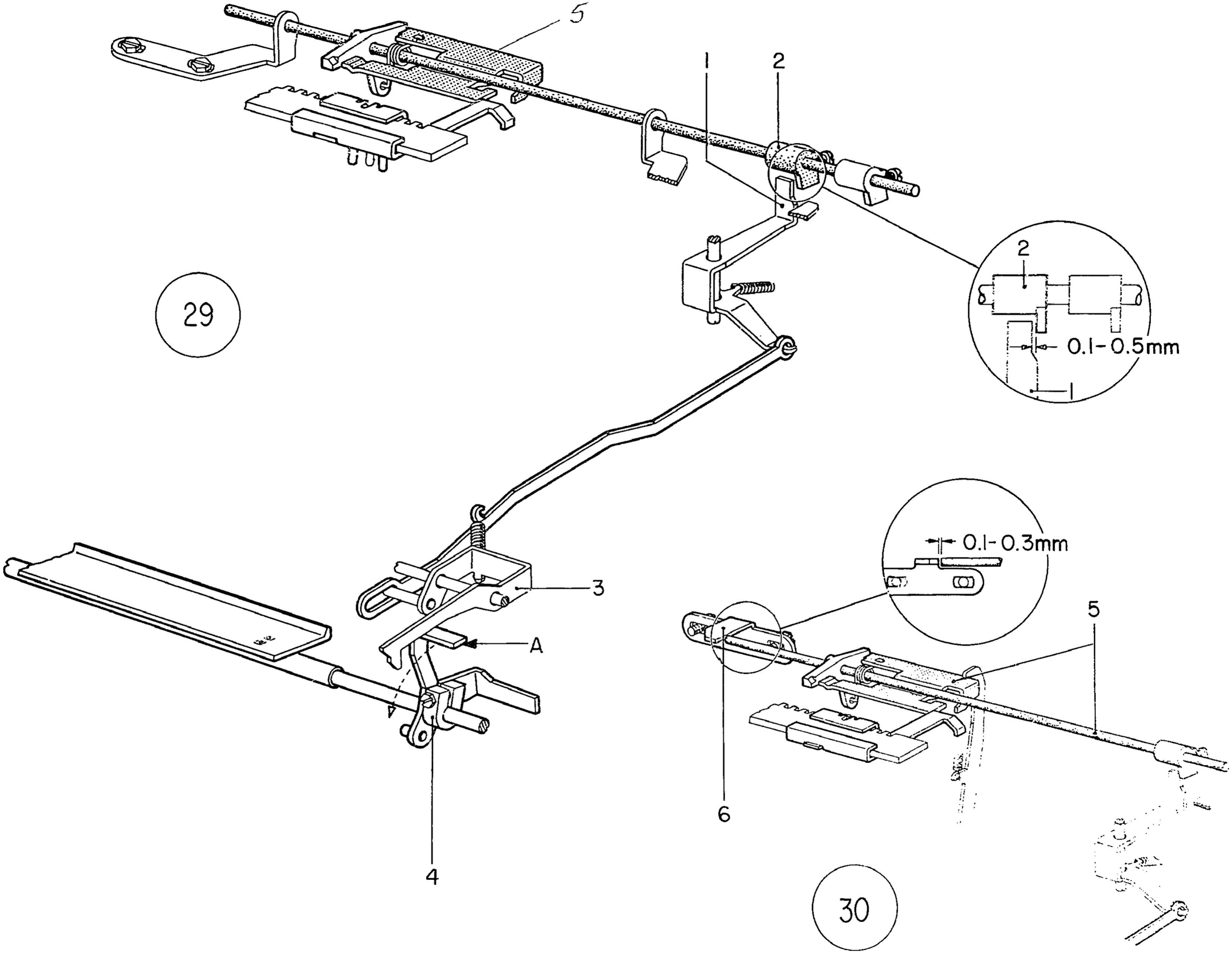
To adjust, reposition the collar (2) to obtain the above conditions.

Margin Control Plate Limit Stop Adjustment Figure 30.

Check the adjustment as follows:

- Type into the right margin until the keyboard is deactivated by the line lock.
- In this position, check that a clearance of 0.1 to 0.3 mm exists between the end of the margin control plate shaft (~~2~~)5 and the limit stop (~~1~~).6 (Refer to the inset drawing.)

To adjust, loosen screws and move the limit stop (~~1~~)6 to the left or right, as required.



29

30

SECTION 22

LINE SPACING AND CARRIAGE RETURN

INTRODUCTION TO LINE SPACING AND CARRIAGE RETURN

At the completion of a writing line it is necessary to:

- Vertically space the writing line by rotating the platen and the paper.
- Return the carriage to the left margin for the next line of writing.

Both of these actions occur through depression of the carriage return key.

LINE SPACE MECHANISM

A line space is the vertical distance between lines of writing. By use of the line space dial the operator can select the number of spaces between the writing lines.

Figure 1 shows the line space mechanism at rest, with the line space dial (1) set at position "2".

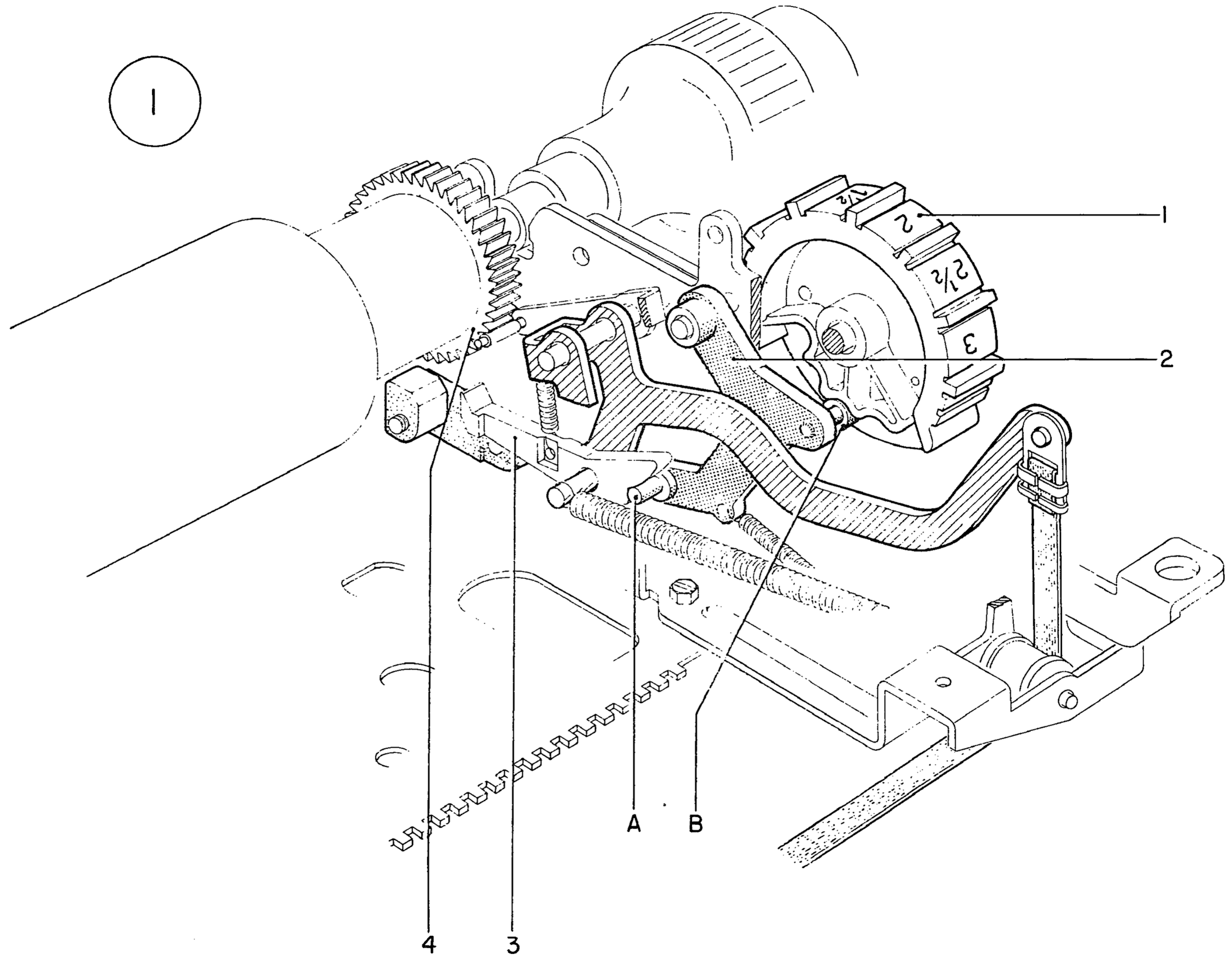
The position of the feed pawl (3) in relation to the ratchet (4) is established by the tail of the feed pawl resting against the stud (A) of the feed pawl positioning crank (2). The position of the crank (2), in turn, is determined by the roller (B) of the crank (2) detenting, through the tension of its spring, into one of five dwells in the line space dial (1).

With the line space dial at position "1", the roller (B) of the feed pawl positioning crank (2) is at the greatest distance from the pivot point of the line space dial. Each dwell in the dial (1) is progressively closer to the pivot point of the dial, therefore, as the dial is rotated the angular position of the feed pawl positioning crank changes. As the angular position of the crank changes, the position of the feed pawl (3) in relation to the teeth of the ratchet (4) also changes.

With the standard 61-tooth ratchet, the line space dial gives the choice of the following five settings:

Dial position	Ratchet teeth rotation	Spacing
1	2	Single line
$1\frac{1}{2}$	3	One and a half line
2	4	Double line
$2\frac{1}{2}$	5	Two and a half line
3	6	Triple line

The platen may also be turned manually one tooth of the ratchet to provide half-line spacing. This facilitates the insertion of exponents or subscripts without losing the original line space pattern.


1/2
2 1/2
A
B

ACTIVATION

When the carriage return is activated, the carriage return drawband (4) moves in the direction of the arrow, and rotates the line space actuating lever (3). The stud (A) of the actuating lever (3), moving in an arc, causes the feed pawl (2) to engage with, and rotate, the ratchet (1). The movement of the line space mechanism is stopped when the feed pawl (2) limits against the line space feed pawl stop (5). This movement rotates the ratchet and the platen the number of line spaces preset on the line space dial.

②

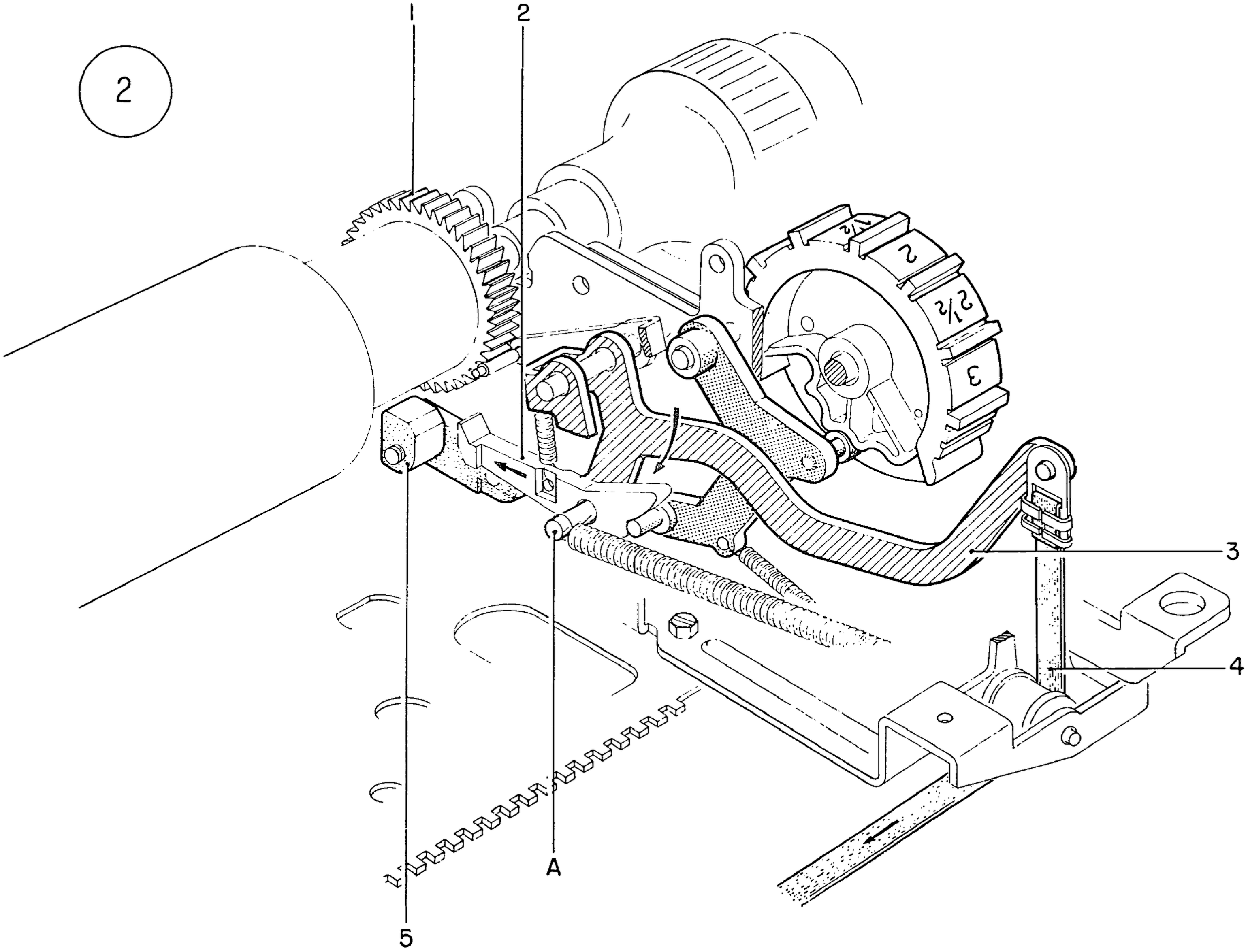
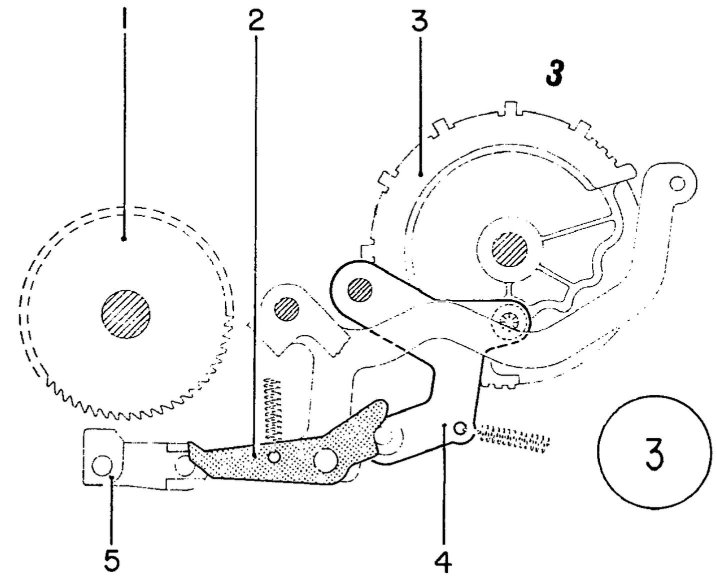


Figure 3 shows the line space mechanism at rest, with the line space dial set at position "3" for triple line spacing. The roller of the positioning crank (4) is in the dwell nearest the pivot point of the dial (3), and the feed pawl (2) is at its greatest distance from the feed pawl stop (5).

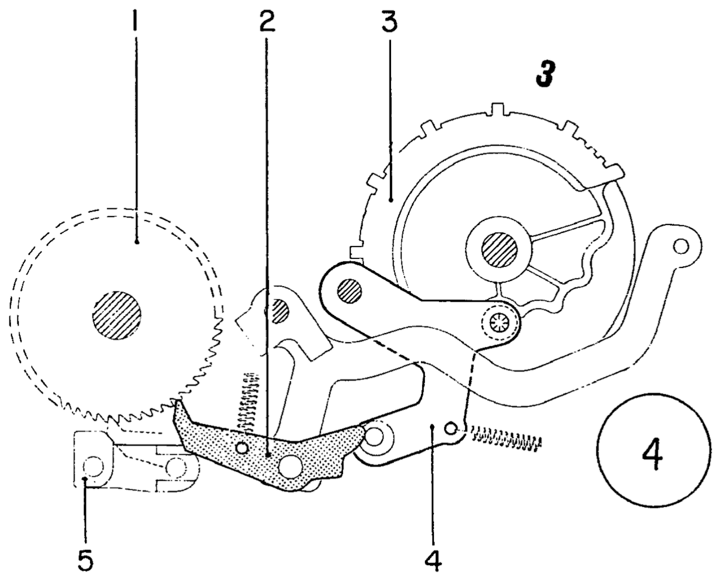
In figure 4 the carriage return has been activated, and the carriage return drawband has started to rotate the actuating lever. This initial movement has engaged the feed pawl (2) with the ratchet (1). The movement of the feed pawl will rotate the ratchet six teeth, giving triple line spacing. The forward movement of feed pawl (2) is limited by feed pawl stop (5). (This is indicated by the dotted lines in the figure.)

Figure 5 shows the line space mechanism at rest, with the line space dial set at position "1", for single line spacing. The roller of the positioning crank (4) is in the dwell farthest from the pivot point of the dial, and the feed pawl (2) is at its closest point to the feed pawl stop (5).

Figure 6 shows that during activation, the feed pawl (2) engages and rotates the ratchet two teeth (as indicated by the dotted lines) before being stopped by the feed pawl stop (5). As a result, the platen rotates a single line space.



③



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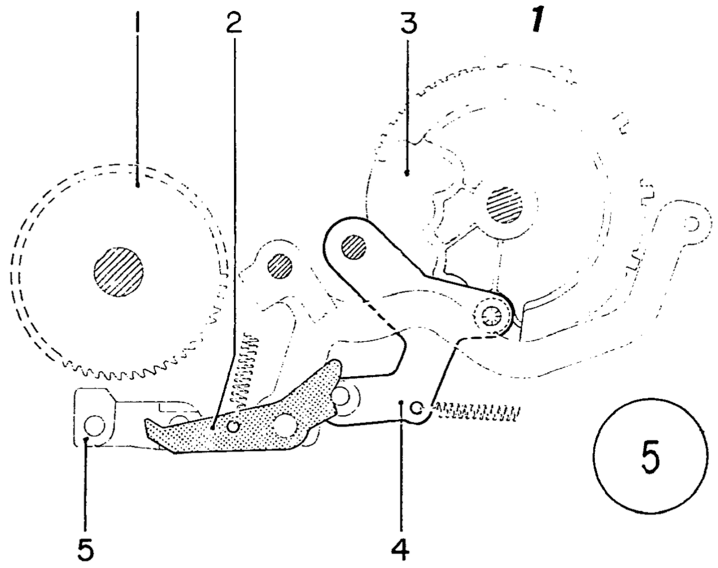

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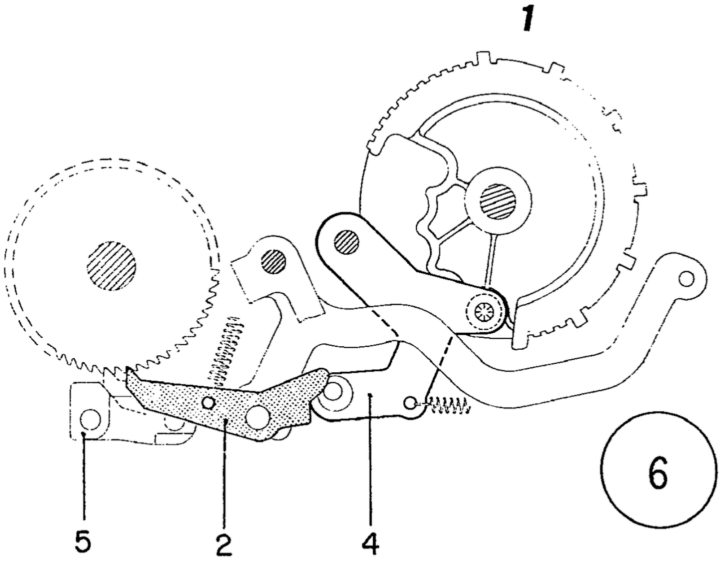


⑥

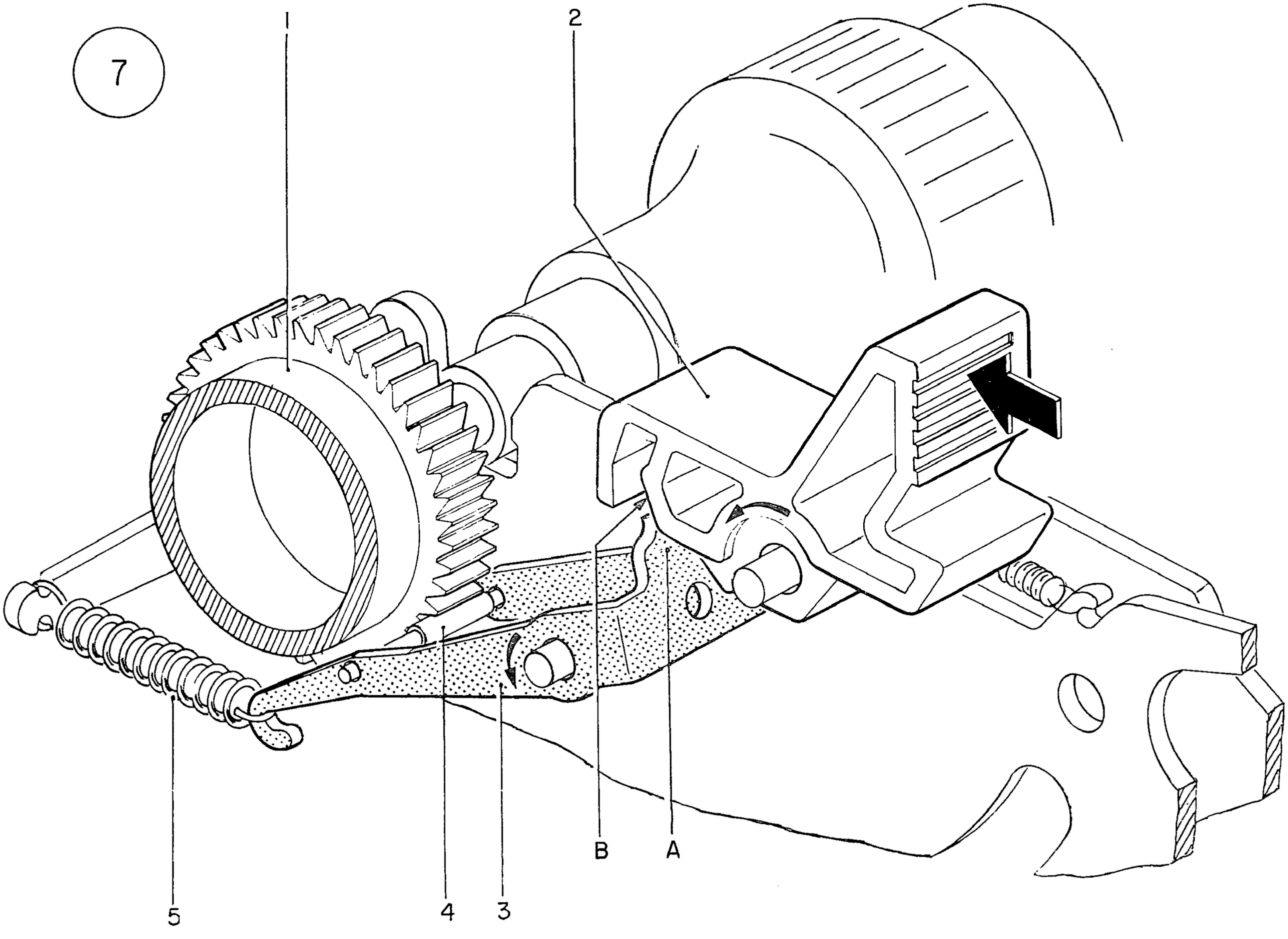
MEMORY LINE FINDER

The memory line finder enables the operator to temporarily leave the line of write and then return exactly to the original line space position.

With the memory line finder (2) in the position shown in figure 7, the detent pin (4) is engaged with the teeth of the ratchet (1), and is held there by the tension of spring (5). With the detent pin (4) engaged with the ratchet (1), any rotation of the ratchet will always correspond to one or more teeth.

When the memory line finder (2) is moved in the direction of the arrow, the profile (B) of the memory line finder contacts the wing (A) of the detent lever (3), and rotates it. The rotation of the detent lever in the direction of the arrow moves the detent pin (4) clear of the ratchet (1). The platen is then free to be rotated to any position, as long as the detent pin (4) is disengaged from the ratchet.

When the memory line finder is moved back, in the direction opposite to the arrow, the detent pin reengages with the ratchet (1), and the platen rotation is again in the original line space pattern.

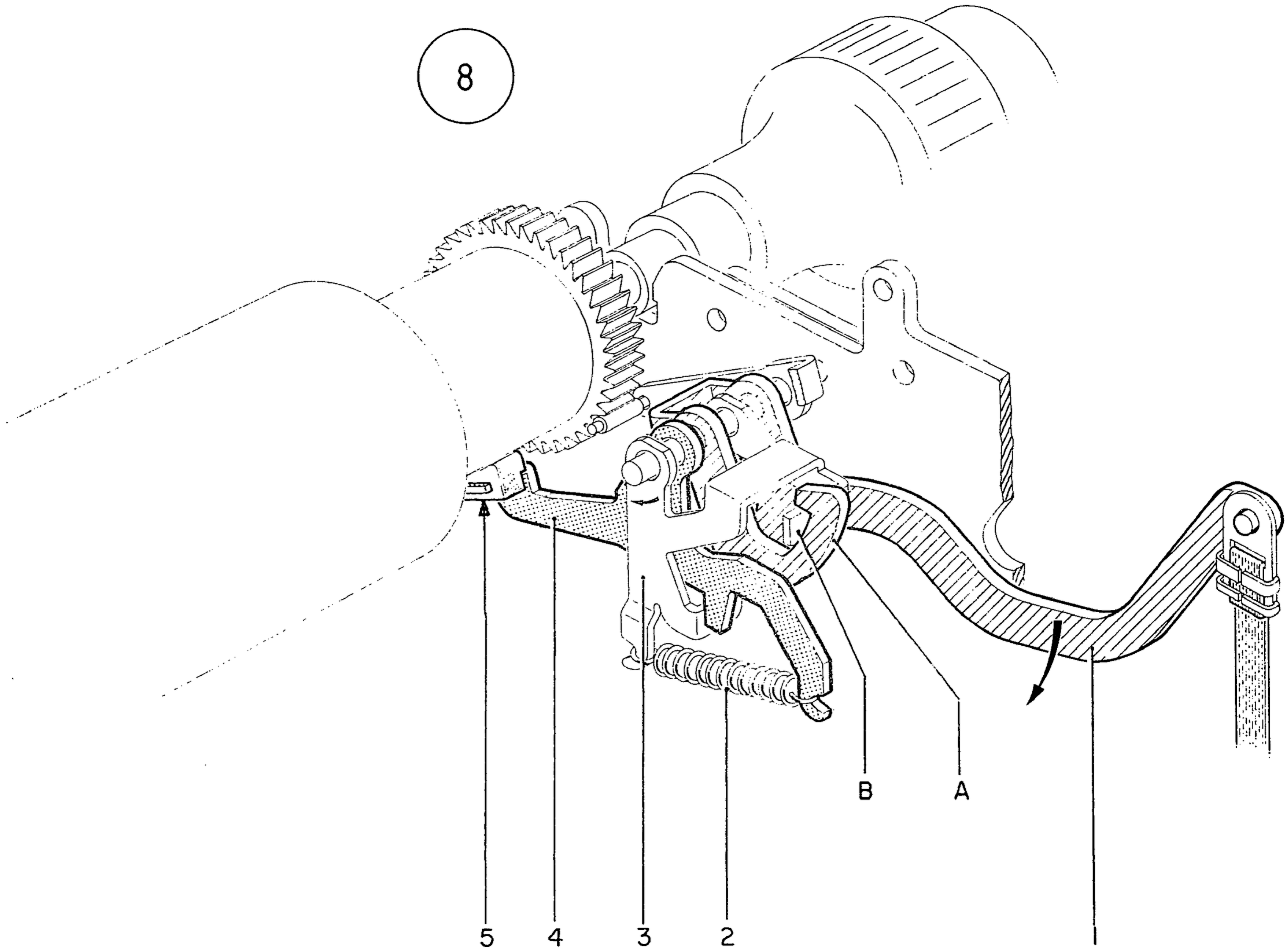

B
A

PLATEN BRAKE

The Editor 4 is equipped with a platen brake, which functions to slow down the rotation of the platen during a line space operation.

If the platen was stopped suddenly during a line spacing operation, the paper could continue to advance slightly through momentum. This possibility is eliminated by the action of the platen brake, which brings the platen to a gradual stop.

As the line space actuating lever (1) is rotated in the direction of the arrow, hook (A) of the actuating lever (1) contacts wing (B) of the bridge (3), and rotates the bridge in the direction of the arrow. The rotation of the bridge pivots the brake lever (4) through the connecting spring (2), and applies pressure through the brake shoe (5) against the metal collar of the platen.


B
A

Line Space Feed Pawl Engagement Adjustment.

To ensure correct line spacing with the line space dial set at the "1" position, the feed pawl (4) must enter midway between the teeth of the ratchet (1), as indicated in the figure.

To adjust, turn the eccentric stud (5).

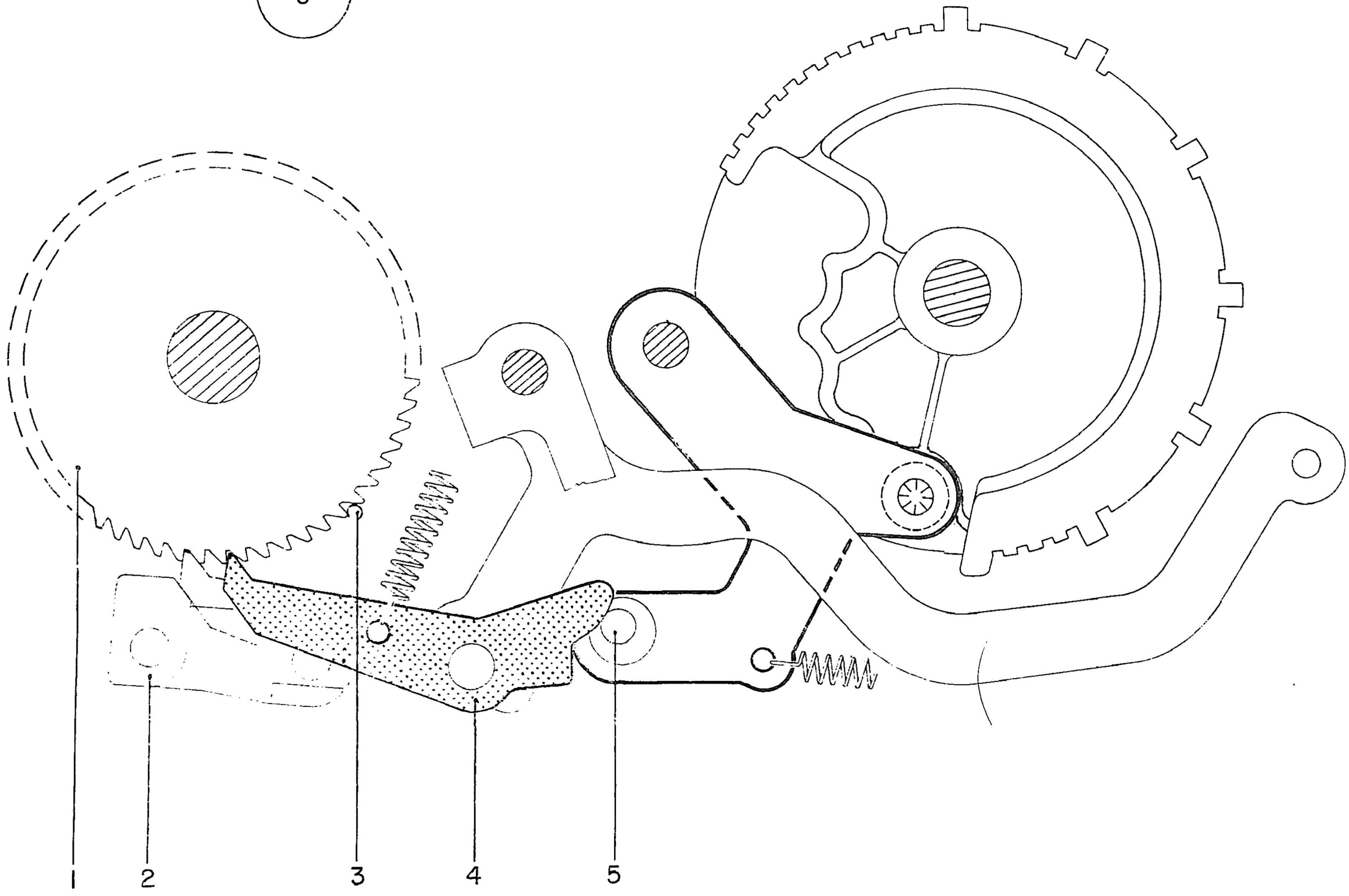
Line Space Feed Pawl Stop Adjustment.

When the line space mechanism is actuated, the feed pawl (4) must rotate the ratchet (1) the required number of teeth without any under or overthrow. The detent pin (3) must locate centrally between two teeth of the ratchet (1).

To adjust, position the line space feed pawl stop (2) as required.

1

9



CARRIAGE RETURN MECHANISM

The function of the carriage return mechanism is to line space the platen, and return the carriage to the start of the writing line.

The carriage is returned by means of the carriage return drawband. One end of the drawband is attached to the line space mechanism at the left end of the platen, and the other end is attached to a friction-drive drum which idles freely on the right end of the power shaft. When the friction-drive drum engages with the disk of the power shaft, the drum revolves, and the drawband returns the carriage to the starting position.

When the carriage return key is depressed, the carriage return mechanism:

- Presets the operation of the carriage return friction clutch.
- Engages the service cam clutch.
- Activates the carriage return drawband drive drum.
- Releases the escapement dog from the rack to prevent noise from the escapement dog detenting over the rack teeth.
- Presets the stopping of the service cam at 90 degrees of the cycle, to keep the friction clutch engaged, and the escapement dog disengaged, until the carriage returns to the start of the writing line (banking position).

When the carriage returns to the banking position it will be stopped by either the left margin stop or the limit stop. This action causes:

- The escapement dog to re-enter the rack.
- The service cam to immediately complete its cycle.
- The carriage return friction clutch to open.

The carriage return cycle is completed, and the carriage is located at the start of the writing line.

ASSEMBLY (REST POSITION)

The rest position of the carriage return key lever frame (16) and link (10) is established by the rubber pad (15) of the keyboard housing, through the spring (20).

The command bail (17) is held at rest, with its arm (D) against the rubber pad of the keyboard housing (18), by the command bridge (19), trip link (21) and spring (22).

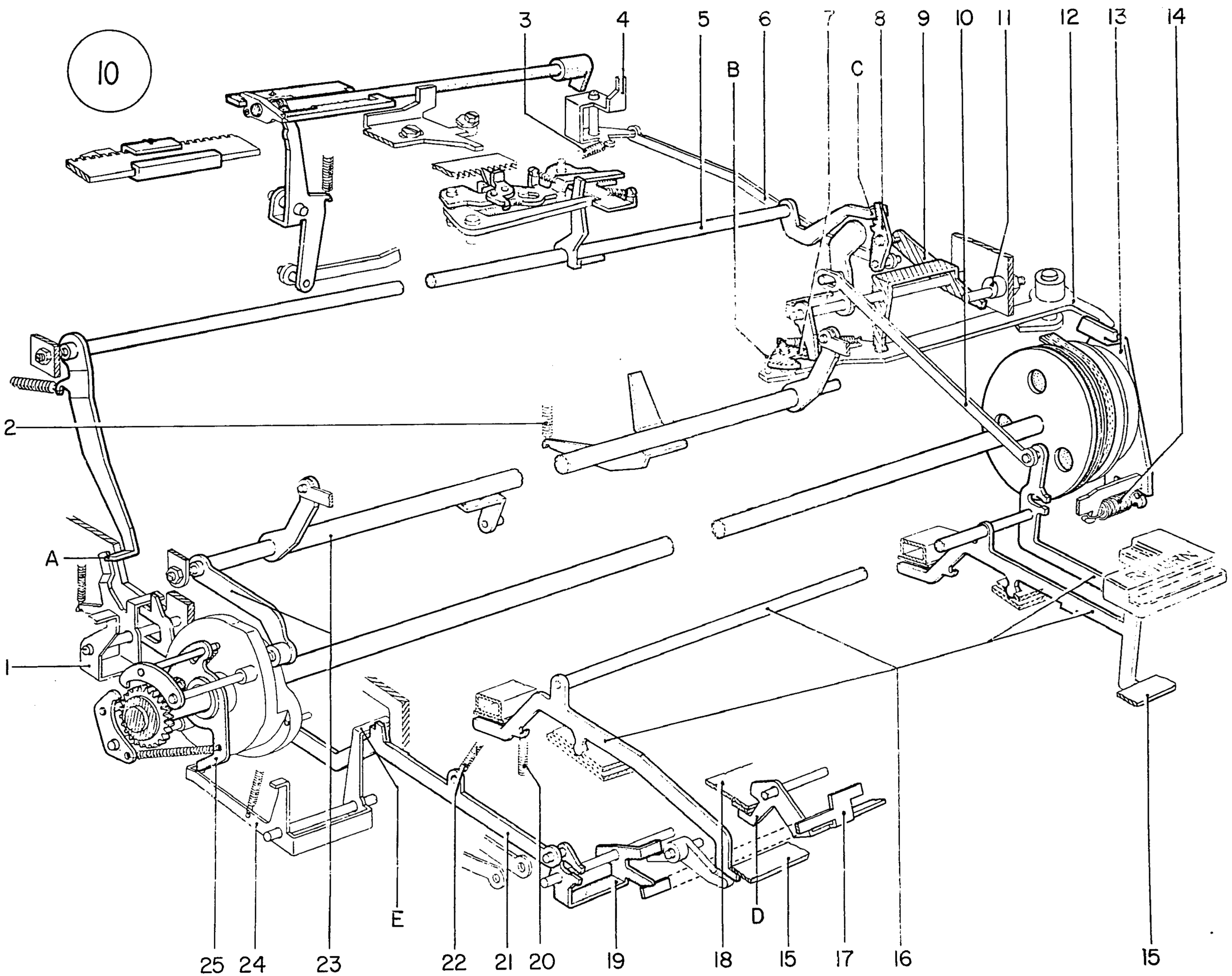
The service cam starting lever (24) is held at rest position through its wing (E) limiting against the side plate of the machine. In this position the flange (25) holds the service cam clutch disengaged.

The rest position of the carriage return friction-clutch control crank (12) is established by the bridge (9) being at rest against the eccentric stud (11). The crank (12) is maintained in the rest position through the action of the pressure plate (13) and its two springs (14). (Only one spring is shown in the figure.) The carriage return control plate (7) is at rest against the stud B, through the tension of its spring.

The escapement dog supplementary release frame (5) is at rest with its wing (A) limiting against the side plate of the machine. In this position the wing (A) holds the 90-degree stop lever (1) at rest.

The carriage return control lever (8) rests against the front of wing (C) through the action of the link (6), release bridge (4), and spring (3).

The reset frame shaft (23) is at rest with its roller against the inner profile of the service cam through the tension of spring (2).


B
C
A
E
D

CARRIAGE RETURN FRICTION-CLUTCH ASSEMBLY

The carriage return friction-clutch assembly provides a friction coupling between the power shaft and the carriage return drawband. This assembly provides the power necessary to line space the platen and return the carriage.

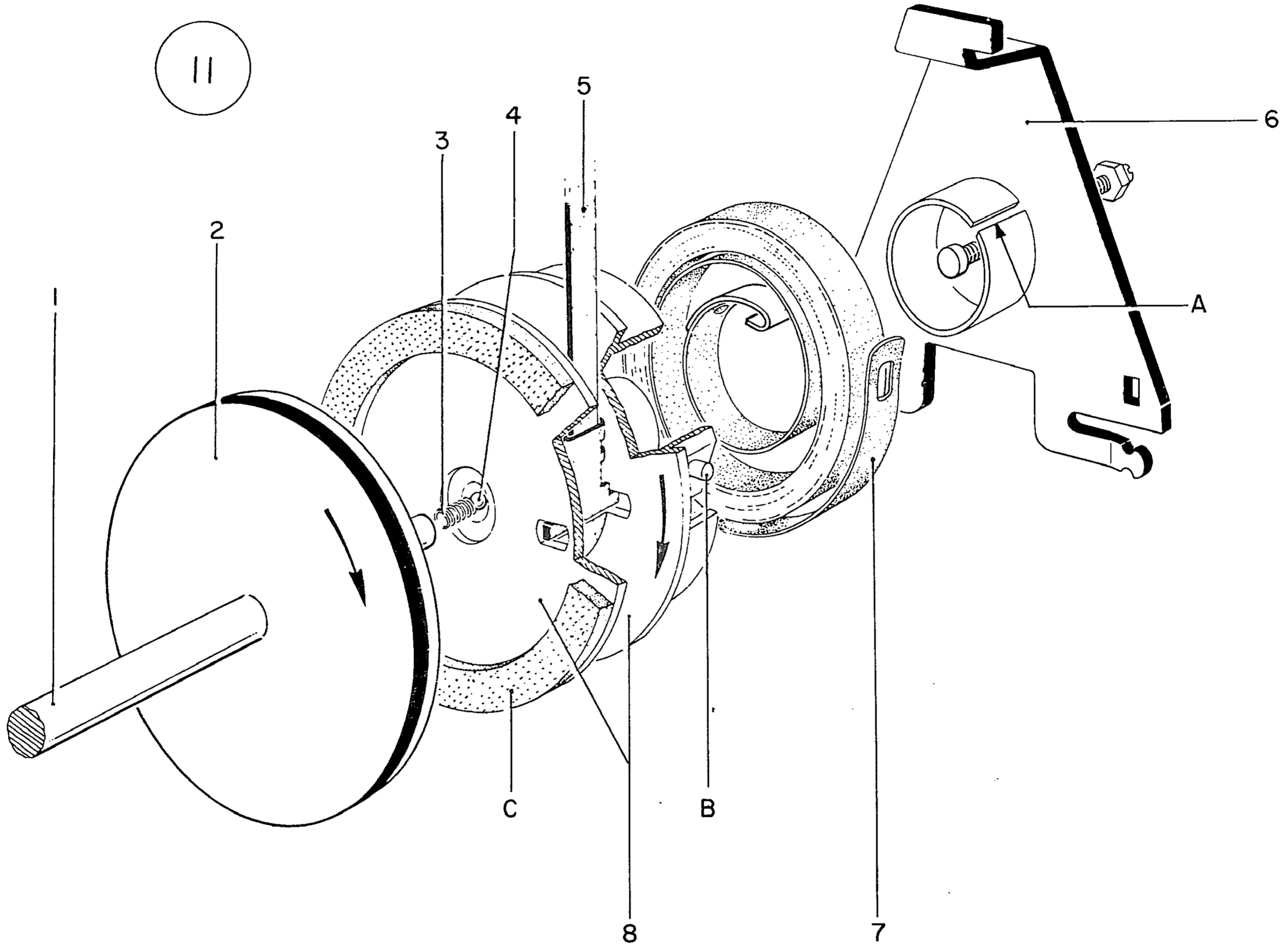
Assembly.

The carriage return friction-clutch assembly consists of:

- Pressure plate (6).
- Carriage return drawband spring (7), which is hooked between the slot (A) and stud (B), and maintains constant tension on the carriage return drawband (5).
- Drum (8) with cork ring (C).
- Spring (3) and ball bearing (4), which at rest position keep the cork ring (C) clear of the friction disk (2).

During a carriage return operation, the cork ring of the drum assembly is brought into pressure contact with the friction disk (2) of the power shaft (1).

The rotation of the power shaft and drum assembly in the direction indicated by the arrows winds the carriage return drawband (5) on the drum (8), causing the platen to line space and the carriage to return.


A
C
B

ACTIVATION

Depression of the carriage return key presets the operation of the carriage return mechanism, and starts a service cycle. The actuation of the service cam will:

- Engage the carriage return friction clutch.
- Disengage the escapement dog from the rack.
- Preset the stopping of the service cycle at 90 degrees of rotation.

Figure 12 shows the carriage return mechanism at rest.

Depression of the carriage return key causes the frame (13) to rotate the rocker (14) and the command bridge (15) in the direction of the arrows. The command bridge moves the trip link (16) rearward, which rotates the starting lever (17) and releases the flange (18) (see lower inset). The service cam clutch engages (see upper inset), and the service cam starts to rotate.

At the same time that the carriage return key is depressed, the link (10) moves forward, and rotates the counter-balance lever (7). The lever rotates the control plate (6) into the path of the right arm (D) of the reset frame shaft (5).

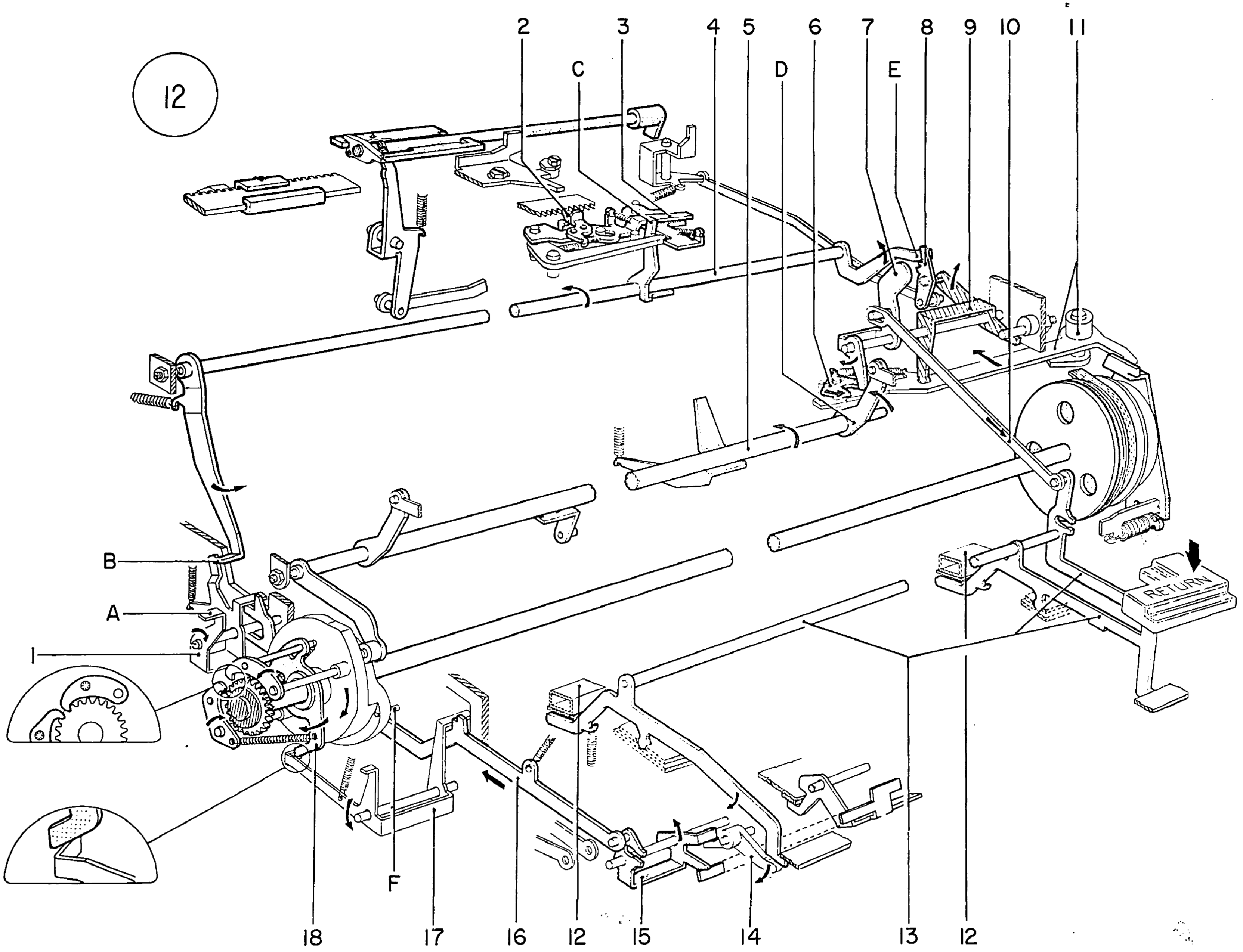
At the beginning of the service cycle the reset frame shaft rotates in the direction of the arrow. The arm (D) of the shaft pushes against the control plate (6), which had been preset, and, in turn, rotates the control crank (11). The rotation of the control crank engages the carriage return friction-clutch, and also rotates the carriage return control lever bridge (9).

As the control lever bridge (9) rotates in the direction of the arrow, the upper step of the control lever (8) pushes against wing (E) of the escapement dog supplementary release frame (4) causing it to rotate and the following actions to occur:

- The escapement dog (2) is released from the rack through the rotation of the arm (C) and release lever (3).
- The wing (B) of the frame moves forward, allowing the 90-degree stop lever (1) to rotate in the direction of the arrow, thus placing its wing (A) in the path of the flange (18).

Consequently, after a rotation of 90 degrees, the service cam is stopped, and the carriage return mechanism remains activated until the carriage returns to the "banking" position.

> Note. Both the carriage return key and the back space key activate a service cycle through the same trip link (16). Therefore, whenever the carriage return key is depressed, it not only starts a carriage return cycle, but also initiates a backspace cycle. The backspace movement of the carriage is, however, of no consequence, since it occurs after the carriage has fully returned to the starting position.

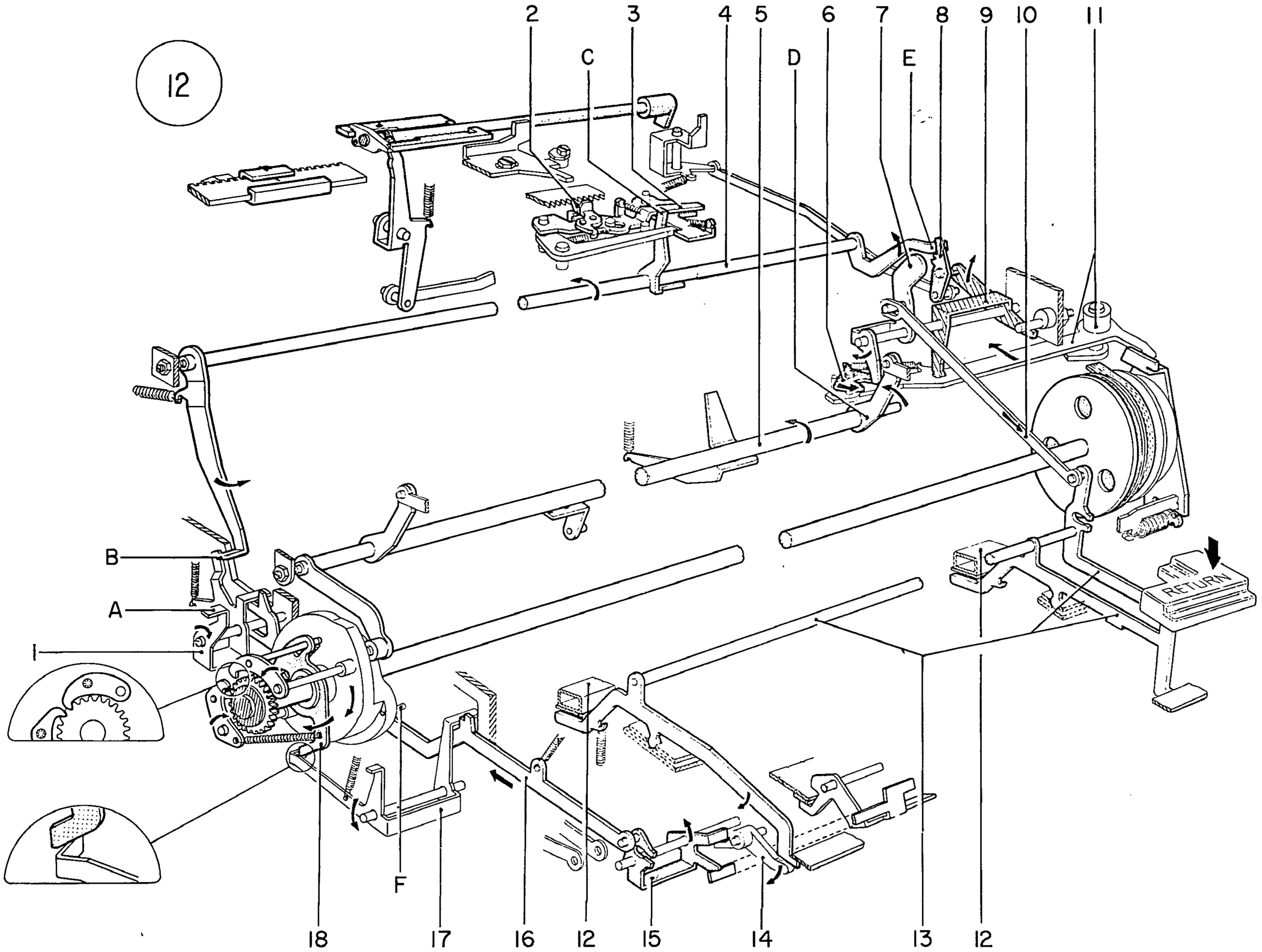

C
D
E
B
A
I
RETURN
F

SINGLE AND REPEAT LINE SPACING CYCLES

When the carriage return key is depressed to its partial (non-repeat) position, the extensions of the frame (13) limit against the key lever locking bar (12). In this position the service cam cycles once only, even though the key is held at the partially depressed position. The starting lever (17), therefore, must be restored to rest position during the service cycle to preset the stopping of the cam at the end of the cycle. This is accomplished through stud (F) of the service cam, in the same manner as described in the activation of the "backspace" mechanism (Section 18, page 190, figure 9).

When the carriage return key is held fully depressed (repeat line spacing position), the key lever locking bar (12) yields, and the service cam cycles continuously. Each cycle of the service cam activates the line space mechanism, resulting in repeat line spacing. Therefore, during the repeat cycles, the starting lever (17) must be rotated a greater distance than during single cycles for it to clear the flange (18). This action also takes place in the same manner as described in the activation of the "backspace" mechanism (Section 18, page 192).

It should be noted that during the return of the carriage the keyboard is deactivated. This is due to the reset frame (not illustrated in the figure) being held rotated, thus preventing the release of any bell crank pull links.


C
D
E
B
A
RETURN
F

RELEASE OF CARRIAGE RETURN MECHANISM

As the carriage returns and approaches the start of the writing line (banking position), its speed is decreased through the action of the air-cylinder mechanism. Therefore, when the carriage reaches the "banking position," the impact of stopping is cushioned, and the following action takes place:

- The escapement dog immediately re-enters the rack.
- The 90-degree stop lever is restored to rest position, allowing the service cam to complete the cycle.
- The carriage return friction-clutch is released.
- The keyboard is reactivated.

When the carriage returns to the banking position, the wing (7) of the left margin stop contacts the banking stop (8), and moves the margin control plate and shaft (9) to the right. Through this movement the air cylinder is actuated by the crank (6) and link (5). (A detailed description of the air cylinder action is given later in this section.)

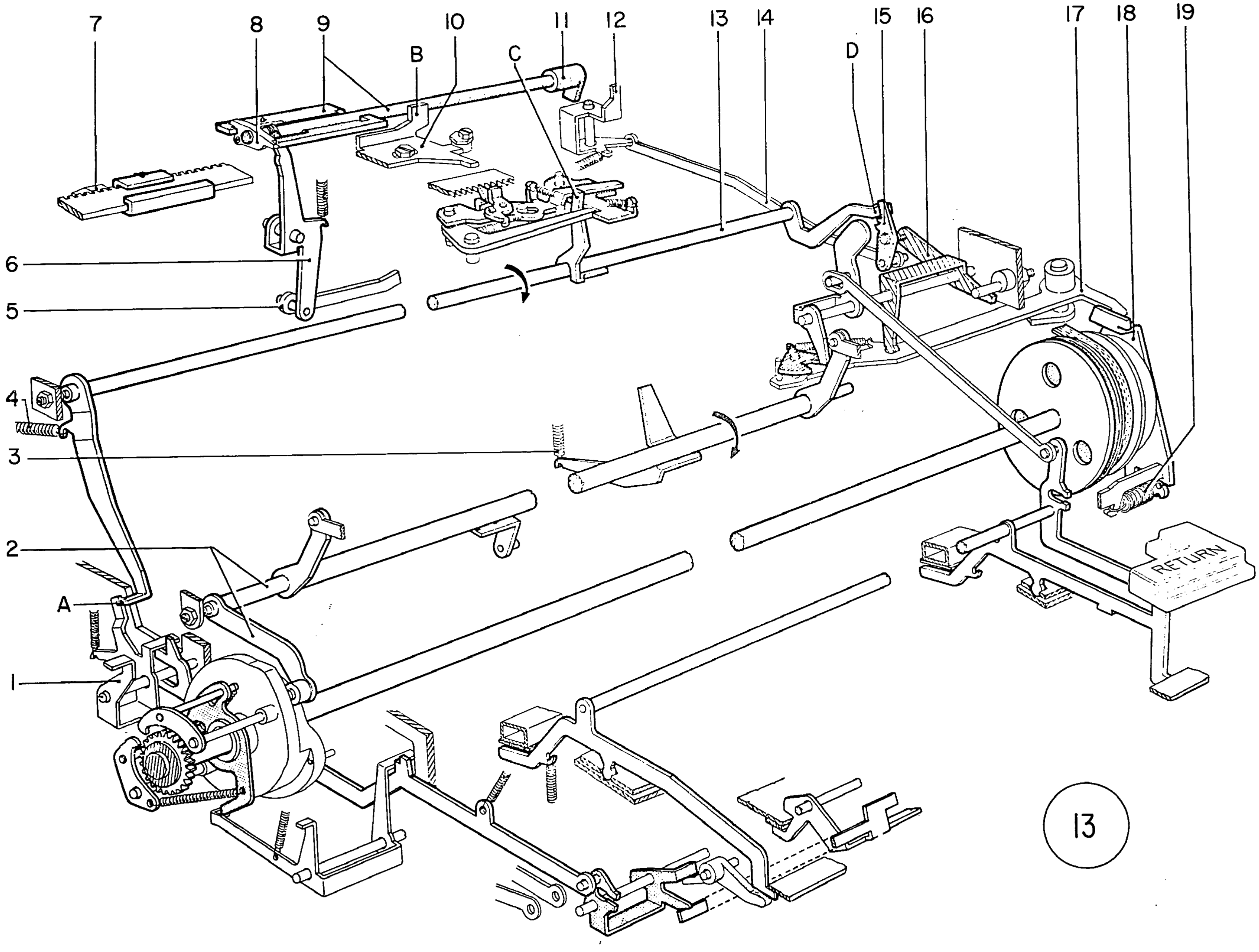
The margin control plate and shaft (9) continues to move to the right until the margin control plate limits against the extension (B) of the service plate (10), which is secured to the carriage fixed rail assembly. In this position the collar (11) rotated the carriage release bridge (12) which, through the link (14), rotated the carriage return control lever (15). When the step of the control lever (15) released its hold on the wing (D), the supplementary release frame (13) immediately rotated (in the direction of the arrow) through the tension of spring (4).

The restoring of the supplementary release frame causes the following action:

- The arm (C) allows the escapement dog to re-enter the rack.
- The wing (A) of the release shaft (13) restores against the side plate of the machine and, in so doing, restores the 90-degree stop lever (1). As a result, the service cam completes the cycle, and the reset frame shaft (2) rotates to rest position through the tension of the spring (3).

The crank (17), pressure plate (18) and bridge (16) restore to rest through the tension of springs (19). (Only one spring is shown in the figure.)

The carriage return friction clutch opens, and the carriage return cycle is completed.


B
C
D
A
RETURN

CARRIAGE CONTROL DURING REPEAT LINE SPACING

At the completion of a carriage return or line space operation, the carriage return drawband develops a slight recoil, causing a momentary slack to occur in the drawband.

During subsequent repeat line space operations the carriage can move a short distance to the left, through the tension of the main spring, before the slack of the drawband is taken up. As a result, the carriage would oscillate back and forth during repeat line space operations. To prevent this oscillation of the carriage, the escapement dog remains engaged with the rack during repeat line spacing cycles, thereby holding the carriage from moving to the left.

Figure 14 shows the rest position of the parts which control whether the escapement dog will be disengaged from the rack or not. In figure 14 the carriage is located at a position other than at the start of the writing line. In this position the upper step of the control lever (15) is in line with the wing of the arm (13).

Figure 15 shows the position of the parts during a carriage return operation. The bridge (16) has been rotated, raising the control lever (15). In turn, the control lever rotated the arm (13) which:

- Disengaged the escapement dog from the rack.
- Stopped the rotation of the service cam at 90 degrees of the cycle.

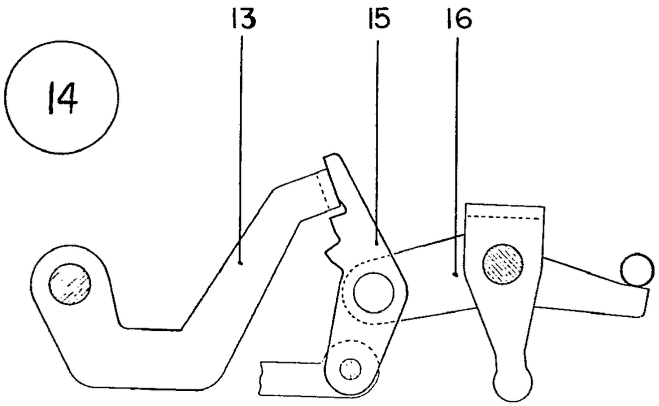
Figure 16 indicates that the carriage has returned to the full "banked" position. The rightward movement of the margin control plate shaft caused the control lever (15) to rotate, in the direction of the arrow, through the link (14). The arm (13) returned to rest, causing:

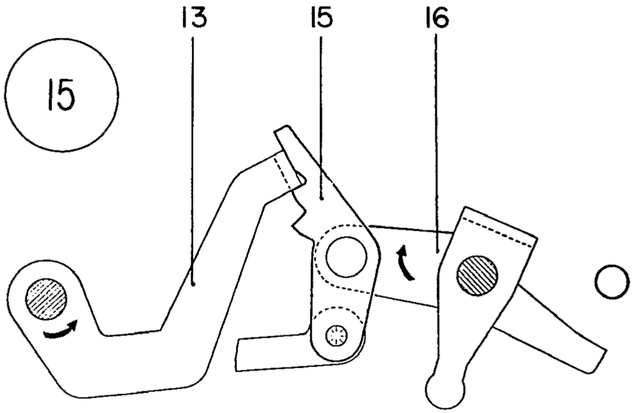
- The escapement dog to re-engage the rack.
- The service cam to complete the cycle.

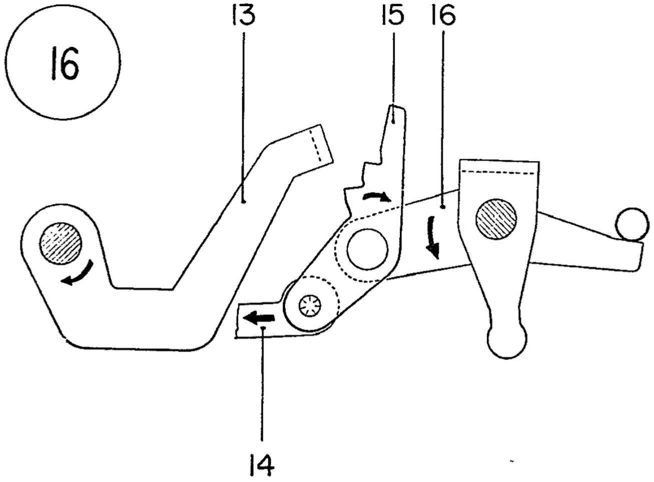
In figure 17 the carriage return cycle is completed. The carriage has moved slightly to the left from the "full banked" position, and is now held by the escapement dog at the start of the writing line. The slight leftward movement of the carriage keeps the control lever (15, figure 17) partially rotated in respect to figure 16. Therefore, with the carriage at the start of the writing line, the lower step of the control lever is in line with the wing of the arm (13).

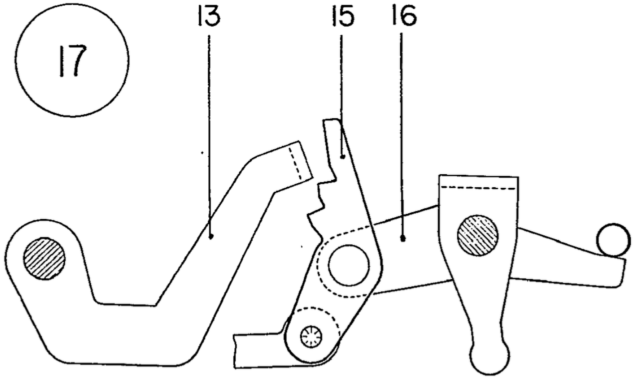
If the carriage return key is now depressed, the bridge (16) will rotate and the control lever (15) will rise. Since the lower step of the control lever is in line with the wing of the arm (13), and the upward movement of the control lever is always the same amount, the resultant rotation of the arm (13) will be less.

The reduced rotation of the arm (13) of the escapement dog supplementary release frame is still sufficient to stop the rotation of the service cam at 90 degrees, but not enough to disengage the escapement dog from the rack. The carriage is, therefore, under the control of the escapement dog during repeat line spacing cycles.









AIR CYLINDER

The air cylinder acts as a shock absorber and cushions the impact of the carriage when the carriage returns to the left margin. The air cylinder is also used during tabulation to cushion the impact of the carriage when tabulating to set tab stops.

Assembly.

The air cylinder consists of the following parts:

- The cylinder (8) which is attached to the sidewall of the machine.
- The gasket (10) which is fitted between the cylinder and the sidewall.
- The piston (11) which is integral with the shaft (14).
- The rubber diaphragm (12) which is mounted on the shaft (14) and is secured by the keeper (13).

The adjustable valve (9) can be positioned to regulate the amount of air that can be drawn through the hole (A), as the piston moves to the left. The smaller the opening, the greater the vacuum, therefore, the more cushioning of the carriage.

Activation (During Carriage Return).

As the left margin stop contacts the banking stop (2), it causes the margin control plate (3) to move to the right. The margin control plate causes the crank (1) to rotate and, in turn, pulls the link (15), shaft (14) and piston (11) to the left. This movement of the piston, together with the diaphragm (12), causes a partial vacuum to form behind the piston. This results in a slowing down and cushioning of the carriage as it reaches the banking position.

Activation (During Tabulation).

As a set tab stop (7) contacts the tabulator stop blade (5), it causes the guide plate (6) to move to the left. The movement of the guide plate causes the rocker (4) to rotate, and thereby actuates the air-cylinder mechanism in a manner similar to that of carriage return.

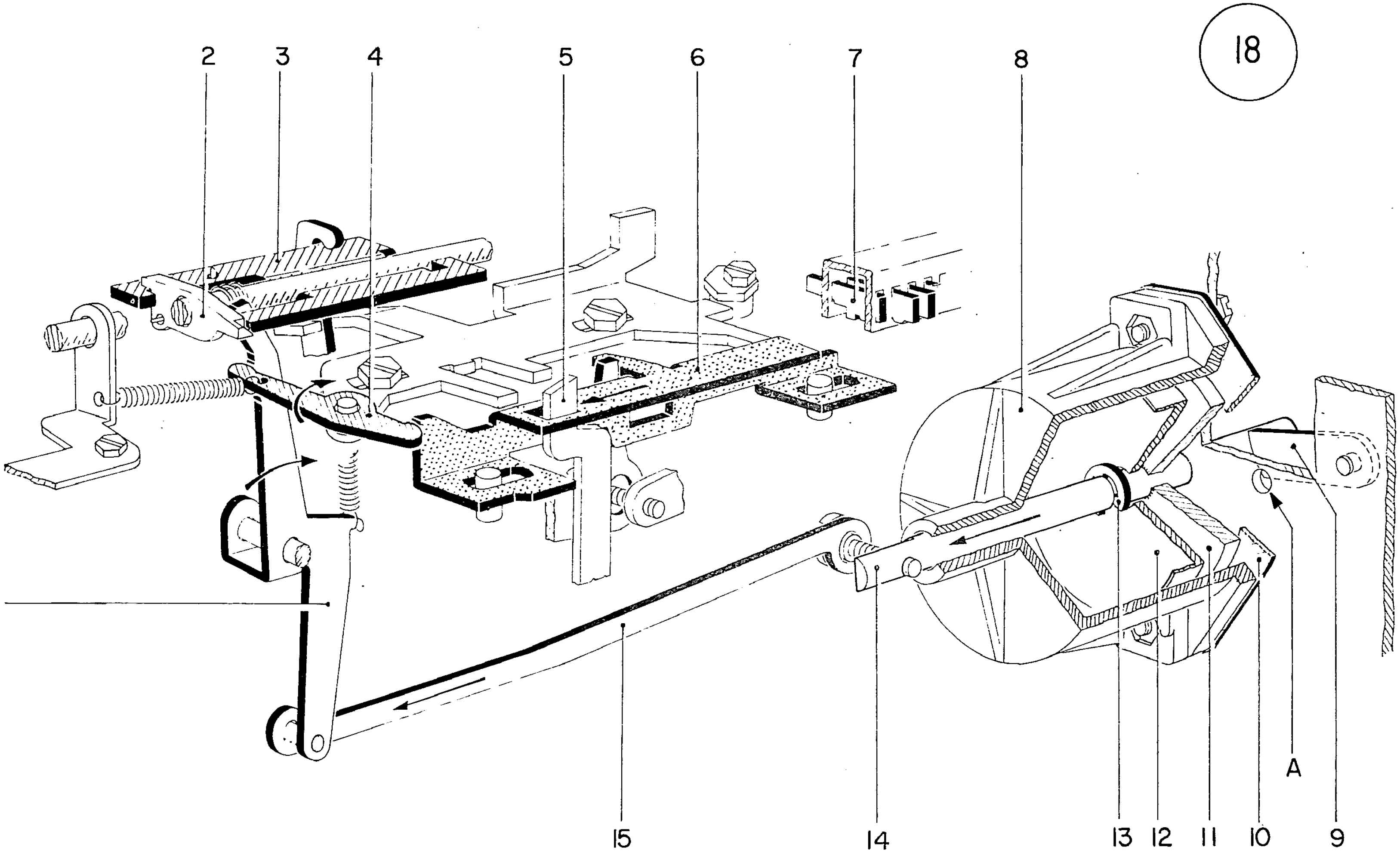
The resultant movement to the left of the piston (11) during tabulation is considerably less than the movement that occurs during carriage return. Therefore, the effective cushioning action of the air cylinder during tabulation is reduced.

Adjustment.

The action of the air cylinder should be adjusted to offer a gentle cushioning effect to the carriage.

To adjust:

- Position the valve (9) in respect to the hole (A) in the sidewall as required.
- Check the effectiveness of the air cylinder by performing short, medium, and long carriage return operations.

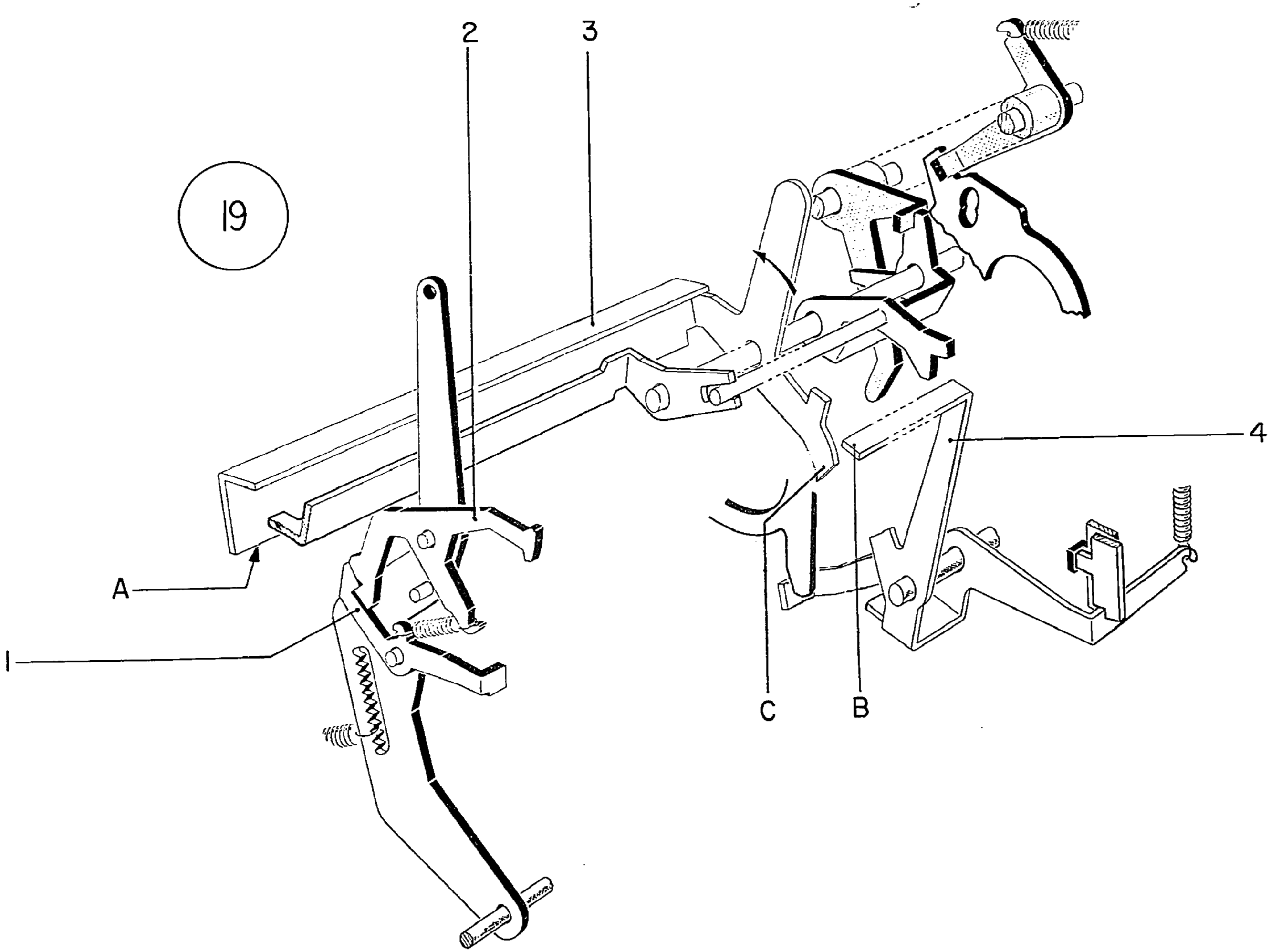

A

KEYBOARD DEACTIVATION DURING A SERVICE CYCLE

During the service cycles pertaining to carriage return and tabulation, all character keys and the space bar are deactivated. This makes it impossible to accidentally type during these two delayed cycles.

During all service cycles the reset frame (3) is rotated in the direction of the arrow. This movement causes:

- The lower edge (A) of the reset frame (3) to rotate and hold all the pull links (2) out of the control of their respective latches (1). When a character key is depressed, the latch (1) will rotate but the pull link (2) will not be released.
- The extension (C) of the reset frame (3) contacts the wing (B) of the space bar starting lever (4), preventing it from being released if the space bar is depressed during a service cycle.


A
C
B

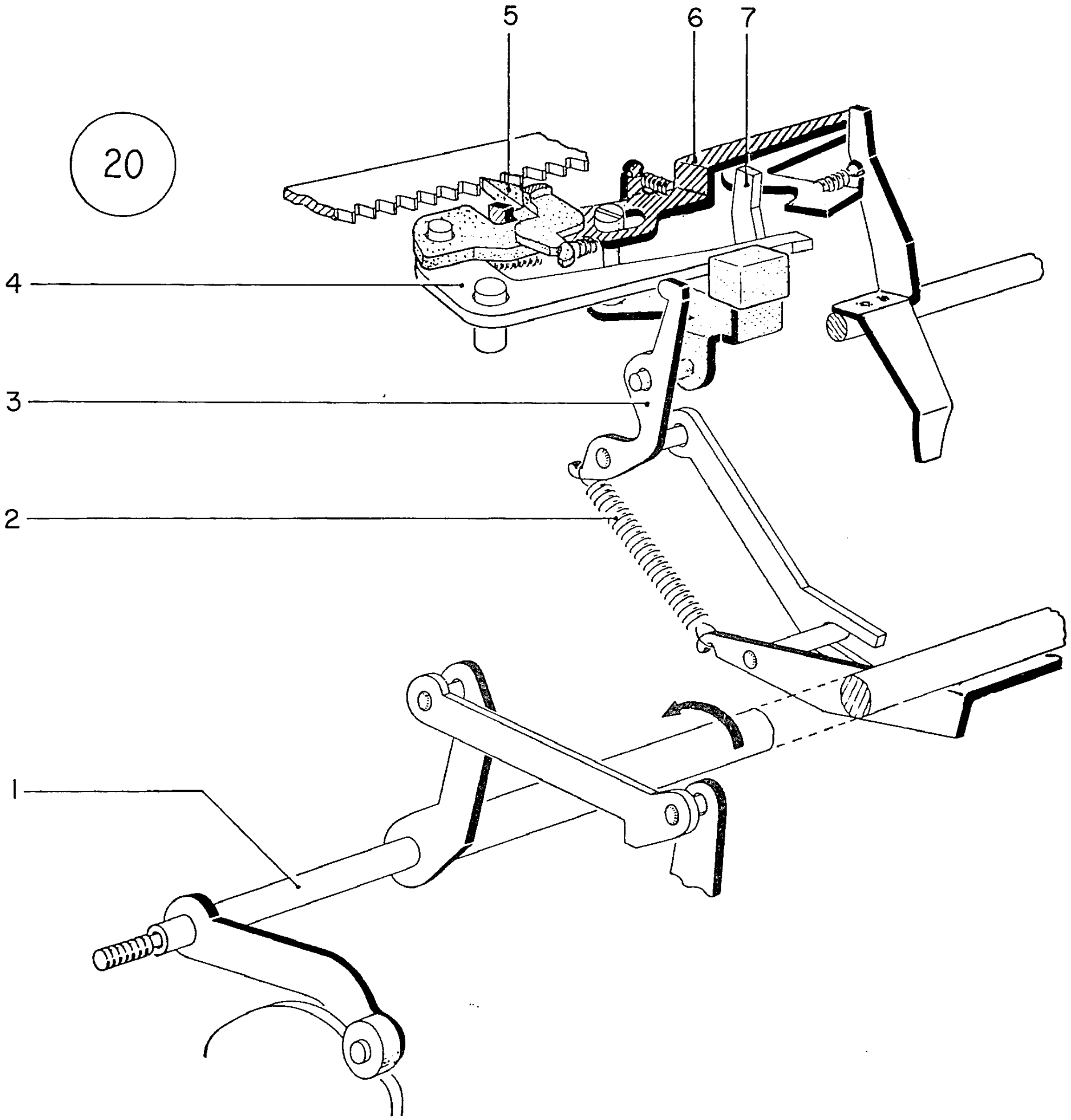
POSITIVE RESTORING OF ESCAPEMENT DOG ADVANCE CRANK

On the previous page it was mentioned that during a service cycle, especially those cycles pertaining to carriage return and tabulation, the space bar and character keys are deactivated. However, this action is not reciprocal; for instance if a character key or space bar is held depressed in the repeat mode, it is possible to actuate a carriage return cycle. The carriage return key could be depressed at a time when the escapement is in the condition illustrated in figure 20.

The figure shows that the escapement dog advance crank (4) has been released and that the escapement dog (5) advanced to the next tooth in the rack. The carriage had not as yet moved, consequently the rack has not restored the advance crank (4).

If at this precise time a carriage return cycle is initiated, the finger (7) rotates rearward, but the escapement dog release lever (6) cannot disengage the dog from the rack. As the carriage returns, the escapement dog being engaged in the rack causes a grinding sound as the dog detents over the teeth of the rack, and the carriage will "underbank" one space at the left margin.

These conditions are prevented from occurring through the action of the following: During all service cycles the reset frame (1) rotates in the direction of the arrow. The spring (2) causes the reset arm (3) to rotate and automatically restores the escapement dog advance crank (4) if it happens to be released at that time.



ADJUSTMENTS

Banking Adjustment.

When the carriage returns to the left margin stop, it must stop at the correct position in which the margin stop is set, without over or under banking.

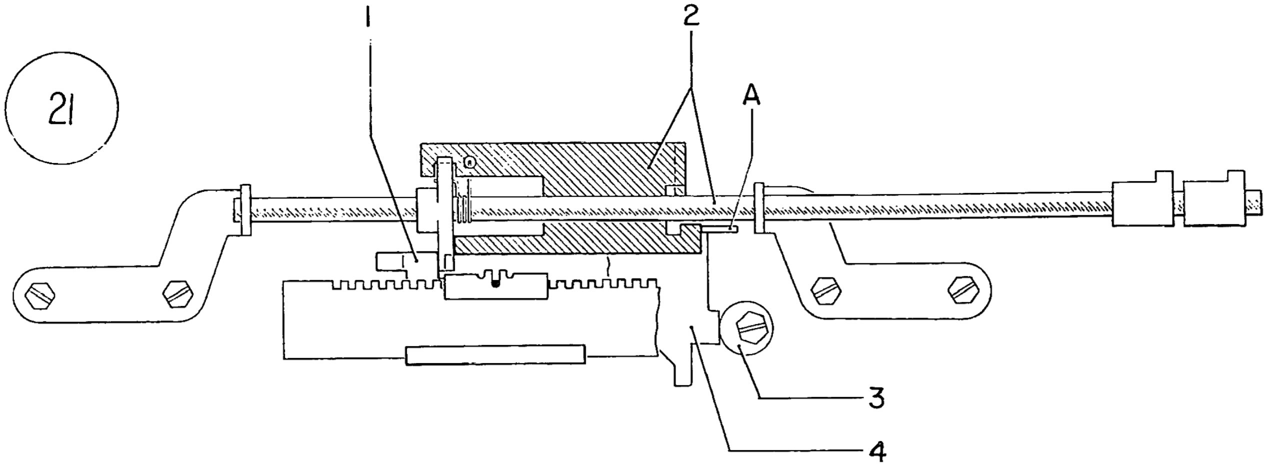
With the carriage held fully to the right, the wing (1) of the left margin stop holds the margin control plate (2) firmly against the stop (A) of the service plate (4) as shown in figure 21. In this position the escapement dog must clear the tooth of the rack, which it is subject to hold with the prescribed clearance shown in figure 22.

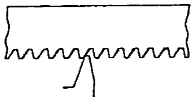
To adjust: Loosen the two fastening screws (5) of the service plate (figure 21A), and laterally position the service plate as required. When the correct position for the service plate has been obtained, tighten the two fastening screws, and adjust the eccentric disk (3) until it just contacts the side of the service plate. (The eccentric disk prevents any possibility of the service plate moving during carriage return operations.)

> Note. The correct position of the service plate also automatically positions the following parts to align correctly with their respective counterparts (figure 21A):
>
> - Margin setting finger by extension (C)
> - Tabulator stop blade by extension (D)
> - Tabulator clearing finger by extension (B)
> - Tabulator setting finger by extensions (D and E)

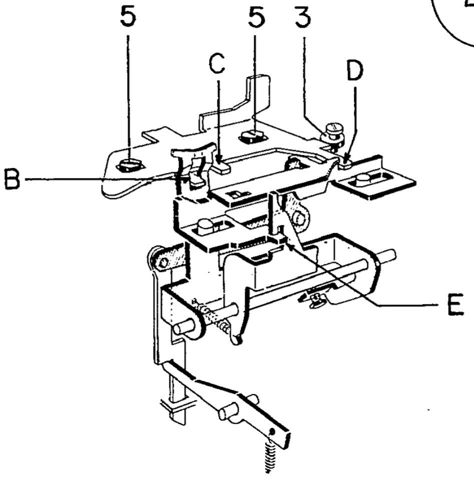
1 - Banking NOTE: Alternate check for banking: a) Carriage return b) Depress the Margin By-pass Key. c) Strike the character - (hyphen). d) Tabulate e) Return the carriage and while holding the carriage in the full banked position, strike the letter 1. The printout should be —1.	104-305	304

21

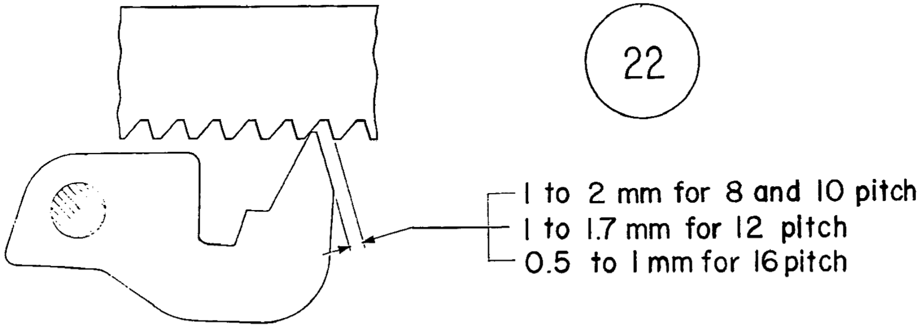

A



21A


5
5
3
C
D
B
E

22


1 to 2 mm for 8 and 10 pitch
1 to 1.7 mm for 12 pitch
0.5 to 1 mm for 16 pitch

Carriage Return Control Plate Adjustment (Rest Position).

During any service cycle, except a carriage return cycle, the carriage return control plate (1) must remain at rest.

Operate any service cycle except a carriage return cycle. The arm (8) of the reset frame must pass the side of the control plate (1) with a clearance of 0.2 mm (figure 23).

This condition is obtained by opening or closing the adjusting slot (E) in the carriage return key lever (7).

Carriage Return Control Plate Adjustment (Active Position).

When the carriage return key is depressed, the carriage return control plate (1) must rotate into the path of the arm (8) of the reset frame with a clearance of 0.2 to 0.6 mm (figure 23).

This condition is obtained by adjusting the eccentric stud (3). After this adjustment is made, recheck the previous adjustment (Carriage Return Control Plate Adjustment - Rest Position).

Carriage Return Friction-Clutch Adjustments.

At rest there should be a clearance of 0.4 to 0.8 mm between the cork disk (B) and the friction plate (A) as shown in figure 24.

To adjust proceed as follows:

- Adjust screw (C) to obtain required clearance.
- After the adjustment, when the carriage return friction clutch is closed, check that the two springs (D) are stretched at least 0.2 mm as shown in figure 25. (Only the front spring is shown in the figure.) If necessary, recheck the adjustment in the above paragraph.
- Check that during a carriage return operation, the carriage return friction-clutch returns the carriage to the left margin stop with a quick and positive action. To test this:
  - Depress the carriage return key and manually hold the carriage to prevent it from returning to the left margin.
  - The friction clutch must slip and, when the carriage is released, it must quickly accelerate and return to the left margin.
  - To adjust, form the spring anchor extensions (F), front and rear, as required (figure 23).

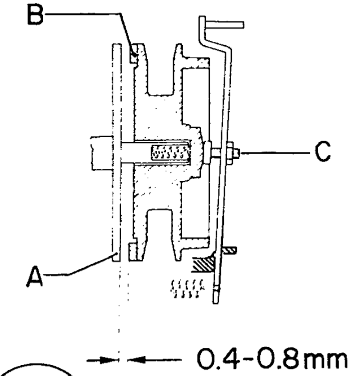
  Caution. The cork disk (B) and friction plate (A) must be free of lubrication.

Carriage Return Drawband Spring Tension Adjustment.

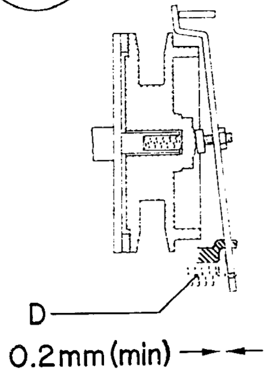
The carriage return drawband spring must supply sufficient tension to the carriage return drawband to keep it taut and prevent looping when the carriage is returned manually.

To adjust (refer to figure 23):

- Disconnect the drawband (5) from the spring drum (6).
- Fully wind the spring drum, back off approximately one turn, and attach the drawband.

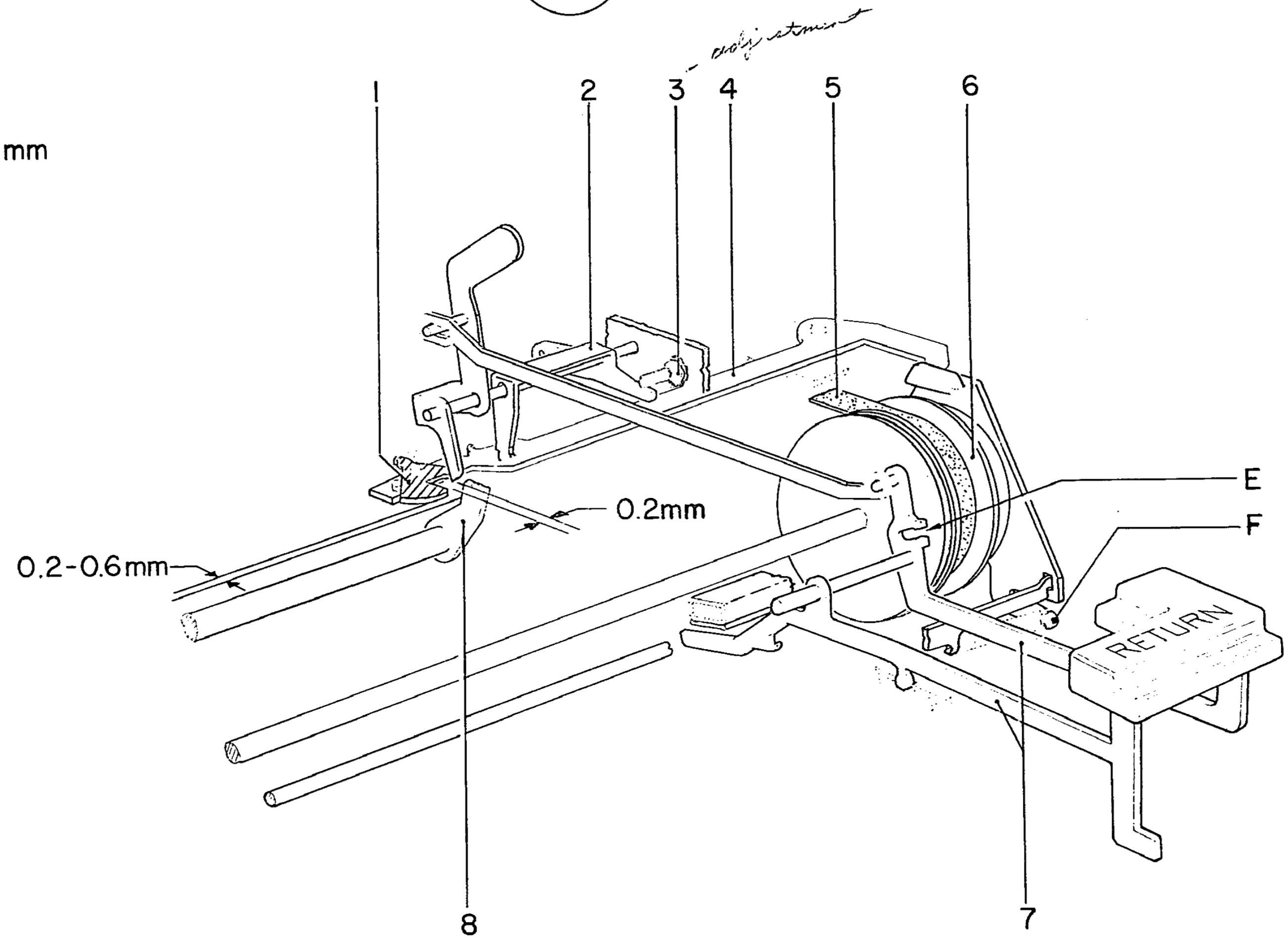

B
C
A
0.4-0.8mm

24


D
0.2mm (min)

25

23


- adjustment
1
2
3
4
5
6
E
F
0.2mm
0.2-0.6mm
RETURN
8
7

Carriage Return Control Lever Adjustment (Active Position).

This adjustment controls:

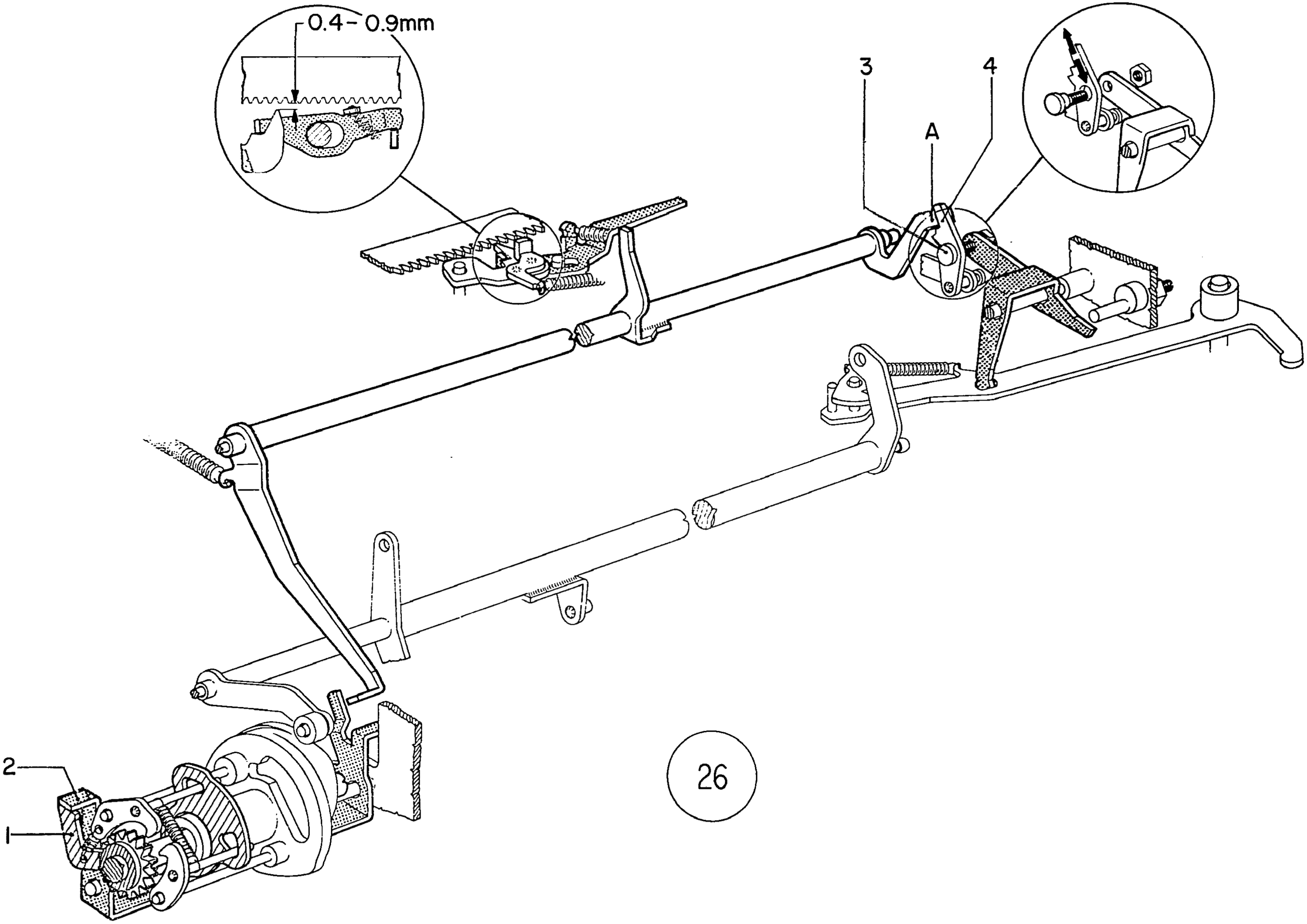
- The distance that the escapement dog releases from the rack during a carriage return operation.
- The stopping of the service cam at 90 degrees of the cycle.

To observe how far the escapement dog releases from the rack during a carriage return operation, perform the following:

- Position the carriage to the extreme left.
- Check that the control lever (4) is in contact with the wing (A) as shown in figure 26.
- Hold the carriage return key depressed.
- Slowly turn the power shaft until the control lever (4) reaches its maximum height.
- With the machine in this condition, check through the access hole in the carriage fixed rail casting that the escapement dog clears the escapement rack between 0.4 to 0.9 mm. (Refer to upper left inset.)

To adjust: Regulate the eccentric (3) which causes the control lever (4) to move up or down, as indicated by the arrows in the upper right inset.

> Note. This adjustment also ensures that the 90-degree stop lever (2) will rotate into position to intercept the flange (1), and thereby stop the service cam at 90 degrees of the cycle.


0.4– 0.9mm
A

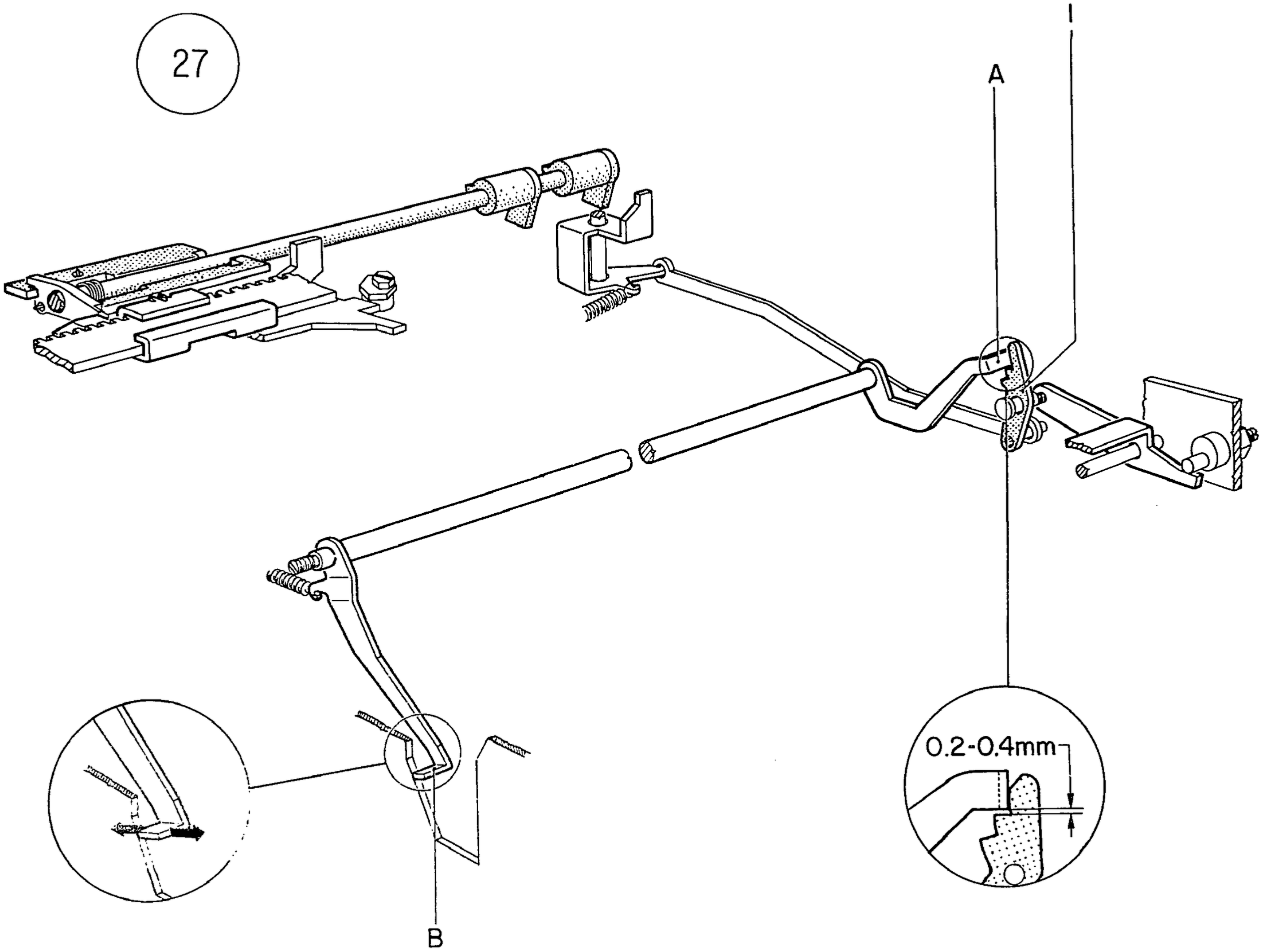
Carriage Return Control Lever Adjustment (Rest Position).

This adjustment ensures that the escapement dog will release from the rack during a carriage return operation.

Check the adjustment as follows:

- Locate the carriage so it is not in a banked position.
- With the wing (B) of the escapement dog supplementary release frame resting against the side wall of the machine, there should be a clearance of 0.2 to 0.4 mm between the upper step of the control lever (1) and the wing (A). (Refer to lower right inset.)

To adjust, form the wing (B) backward or forward, as indicated by the arrows in the lower left inset.


27
A
I
0.2-0.4mm
B

Carriage Return Release Adjustment.

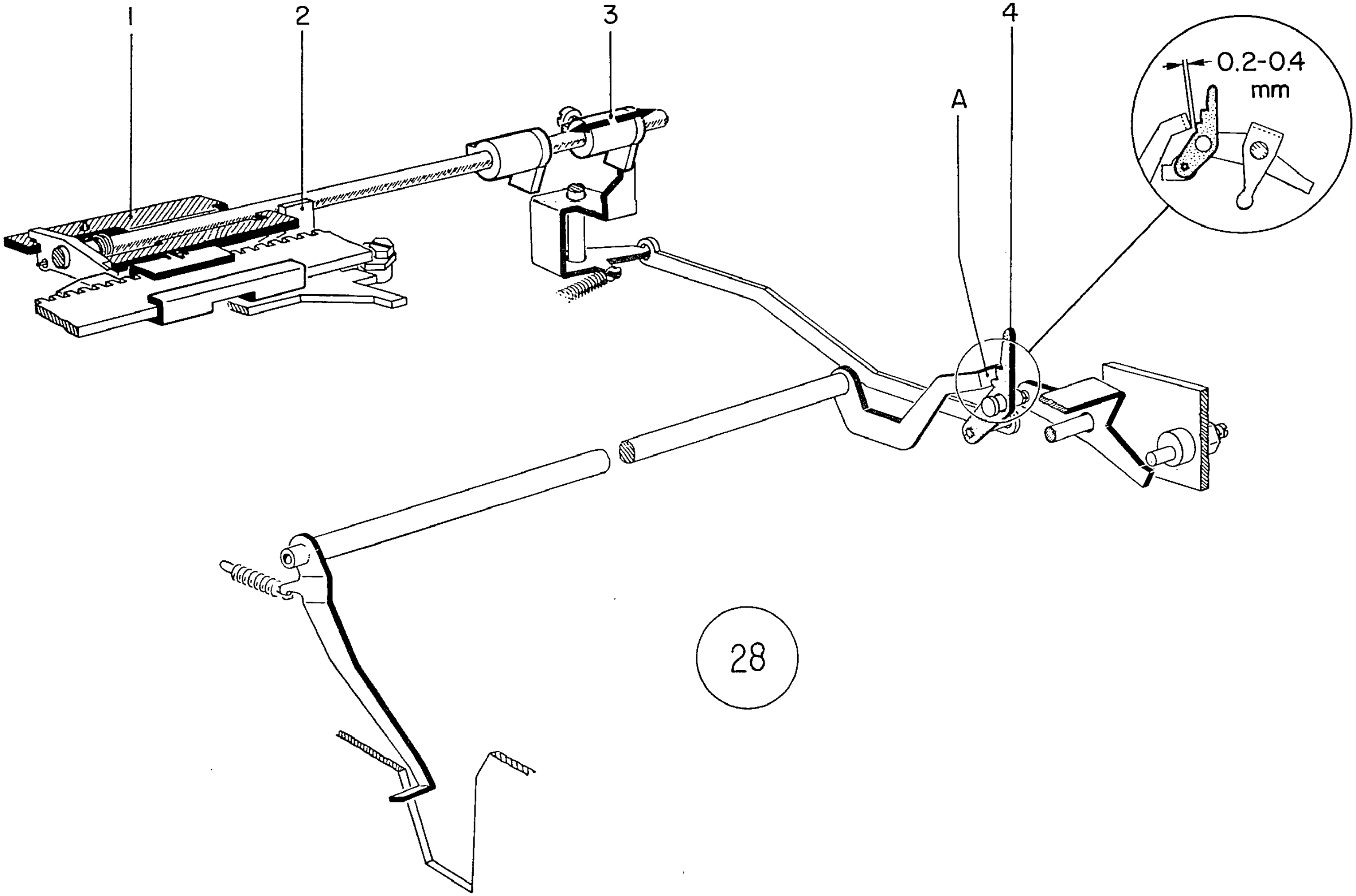
When the carriage returns to the start of the writing line, the escapement dog must re-engage with the rack, and the service cam must complete its cycle to disengage the carriage return friction-clutch. This is accomplished by the control lever (4) releasing its hold on the wing (A) as the carriage reaches the fully banked position.

To check the release of the control lever (4), perform the following:

- Hold the carriage return key depressed.
- Turn the power shaft until the service cam stops at 90 degrees of the cycle.
- Manually move the carriage to the fully banked position and hold it there. (In this position the carriage is stopped by the margin control plate (1) limiting against the extension of the service plate (2).
- With the machine in this position, the control lever (4) must clear the wing (A) between 0.2 to 0.4 mm as indicated in the inset.

To adjust, laterally position the collar (3) after loosening its setscrew.

> Note. This adjustment automatically aligns the lower step of the control lever (4) with the wing (A) when the carriage is at the start of the writing line (repeat line spacing position).


A
0.2-0.4
mm

SECTION **23**

CARRIAGE RELEASE BUTTONS

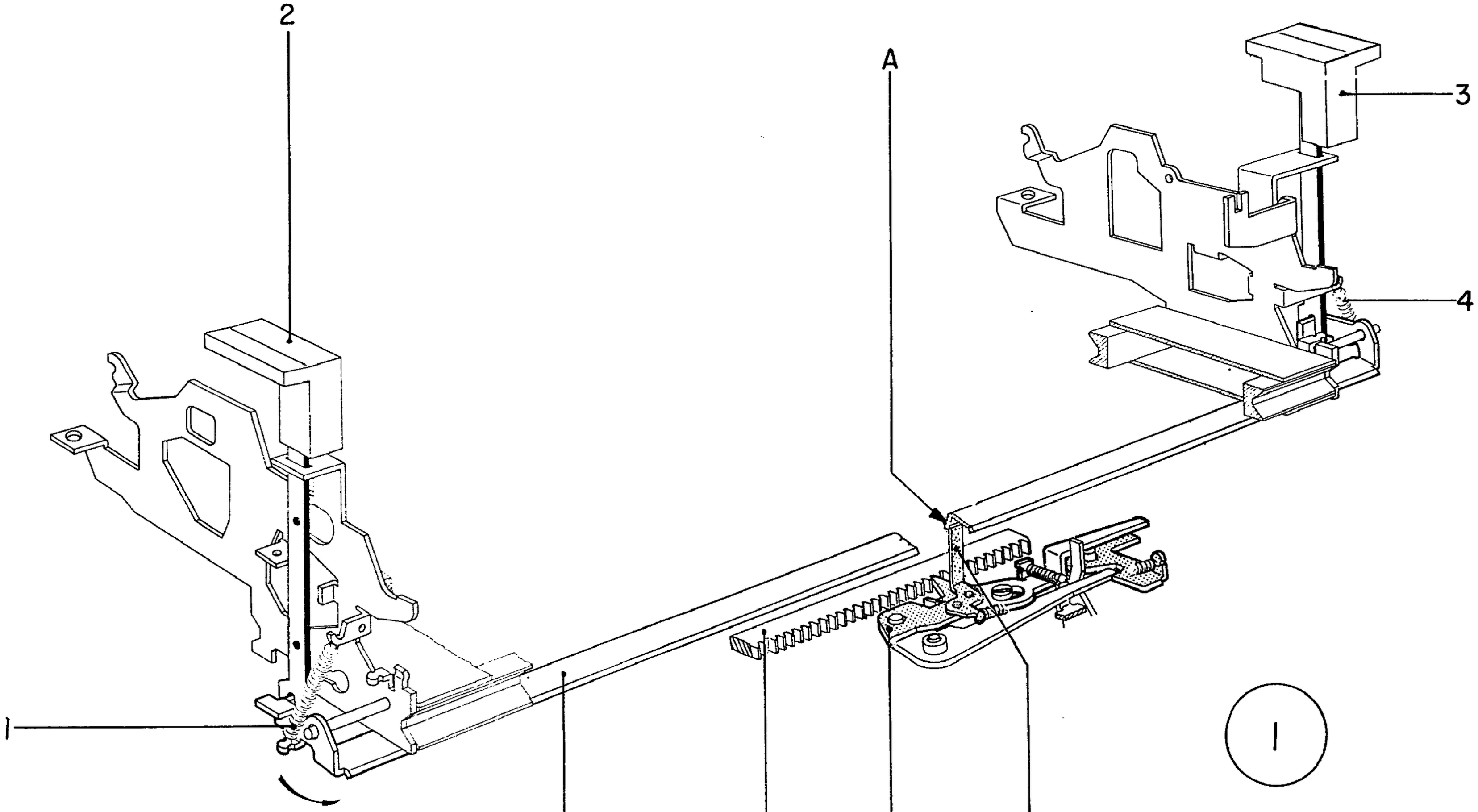
CARRIAGE RELEASE BUTTONS

To manually move the carriage to the left, it is necessary to disengage the escapement dog from the rack.

Depression of either carriage release button causes the escapement dog to disengage from the rack in the following manner:

- Depression of either carriage release button (2 or 3) causes the escapement dog release bail (7) to rotate in the direction of the arrow.
- The lip (A), which extends along the entire length of the bail, contacts the escapement dog extension (B) and rotates the escapement dog (5) from the rack (6). The carriage is then free to move.

When the carriage release button is released, the springs (1 and 4) restore the bail, thus allowing the escapement dog to re-engage the rack.


A
B

SECTION **24**

TABULATION

TABULATION

Tabulation is a feature which facilitates the rapid movement of the carriage to predetermined positions. Tabulation is controlled from the keyboard by:

- The tabulator bar
- The tab clear key
- The tab set key

TABULATOR STOPS (SETTING AND CLEARING)

The tabulator stops are assembled in the tabulator rack and spaced to coincide with the pitch of the escapement rack. The tabulator rack is attached to the carriage frame and is adjustable in respect to the escapement rack.

The function of the tab set key is to set a stop in the working position, as shown in figure 3. When set, a tabulator stop is positioned so that its lug (A) will stop the carriage in the selected position.

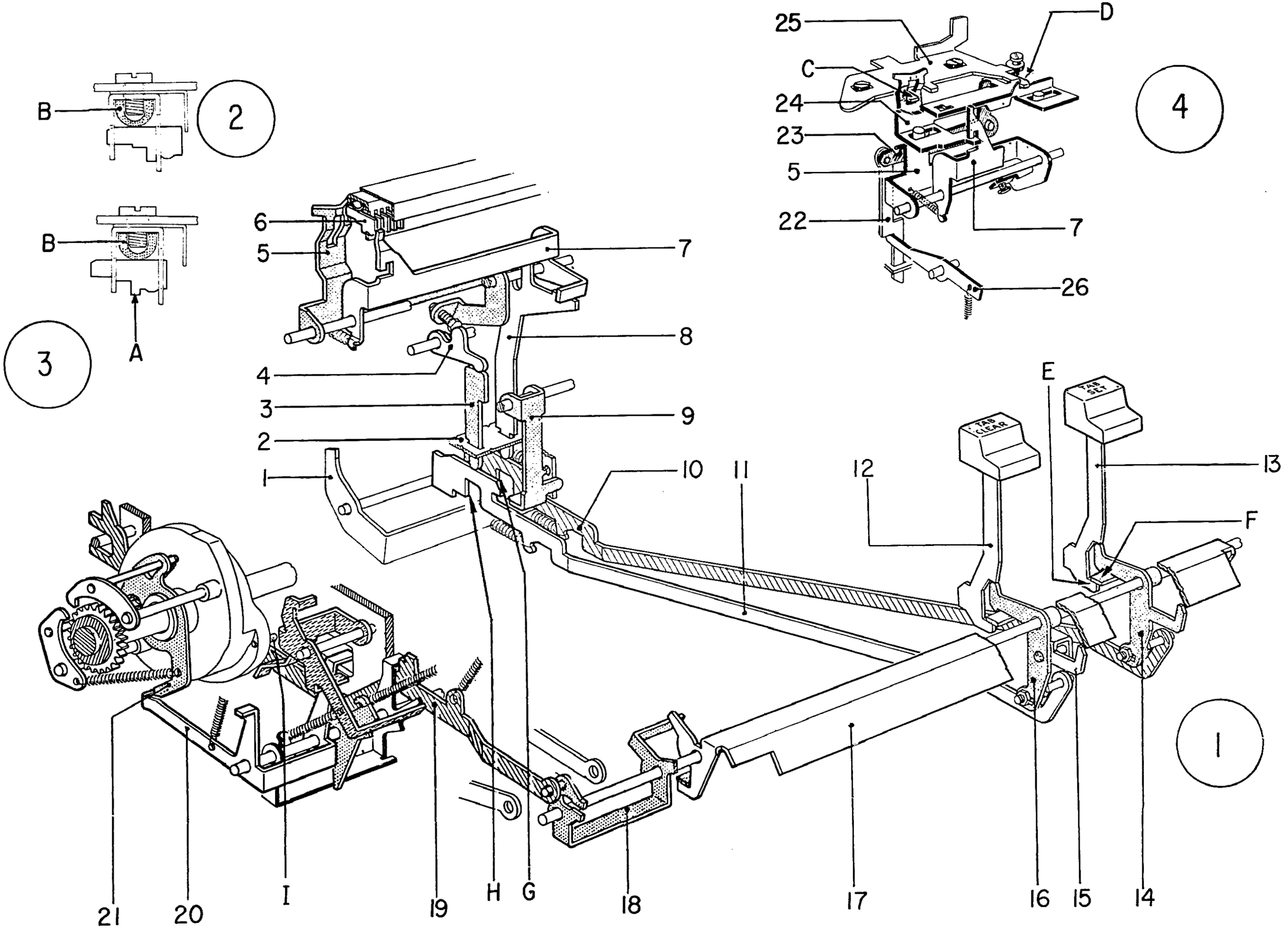
The tab clear key is used to restore the tabulator stops to the inoperative position, figure 2. When cleared, the tabulator stops are no longer in position to stop the carriage movement.

ASSEMBLY (REST POSITION)

Figures 2 and 3 show a tabulator stop in the cleared and set positions respectively. In each case the tabulator stop is held in position by the friction of the rubber tubing (B).

In figure 4 the tab set and clear fingers and related parts are at rest. The lateral position of the tab clear finger (5) is determined by the projection (C) of the service plate (25). The lateral position of the tab set finger (7) is established by the stop blade slide (24), which rest against the extension (D) of the service plate (25). The stop blade slide (24) is held against the extension (D) by the spring of lever (26), through the link (22) and the crank (23).

Figure 1 shows that the angular rest position of the setting finger (7) is determined by the plunger (8) resting on the guide plate (2). The spring of the activating link (10) holds the activating link, the crank (14), and the key stem (13) at rest, with the lug (E) of the key stem against the rubber stop (F). Similarly, the angular rest position of the tab clearing finger (5) is determined by the intermediate crank (4) and the plunger (3) resting on the guide plate (2). The spring of the activating link (11) holds the activating link, crank (16), and the key stem (12) at rest with the lug of the key stem (12) against the rubber stop. When either the tab set or tab clear key is depressed, the respective activating link (10) or (11) is raised by the universal bar (1) during a service cycle.


B

②

B
A

③

D
C

④

TAB CLEAR
TAB SET
E
F
I
H
G

①

ACTIVATION

Depression of the tab set key causes the key stem (13) to rotate the crank (14), which:

- Moves the activating link (10) forward so that its step (G) is over the universal bar (1).
- Rotates the service cam activating bail (17) which, through the command bridge (18), moves the trip link (19) rearward. This movement causes the starting lever (20) to release its hold on the flange (21), thus starting a service cycle.

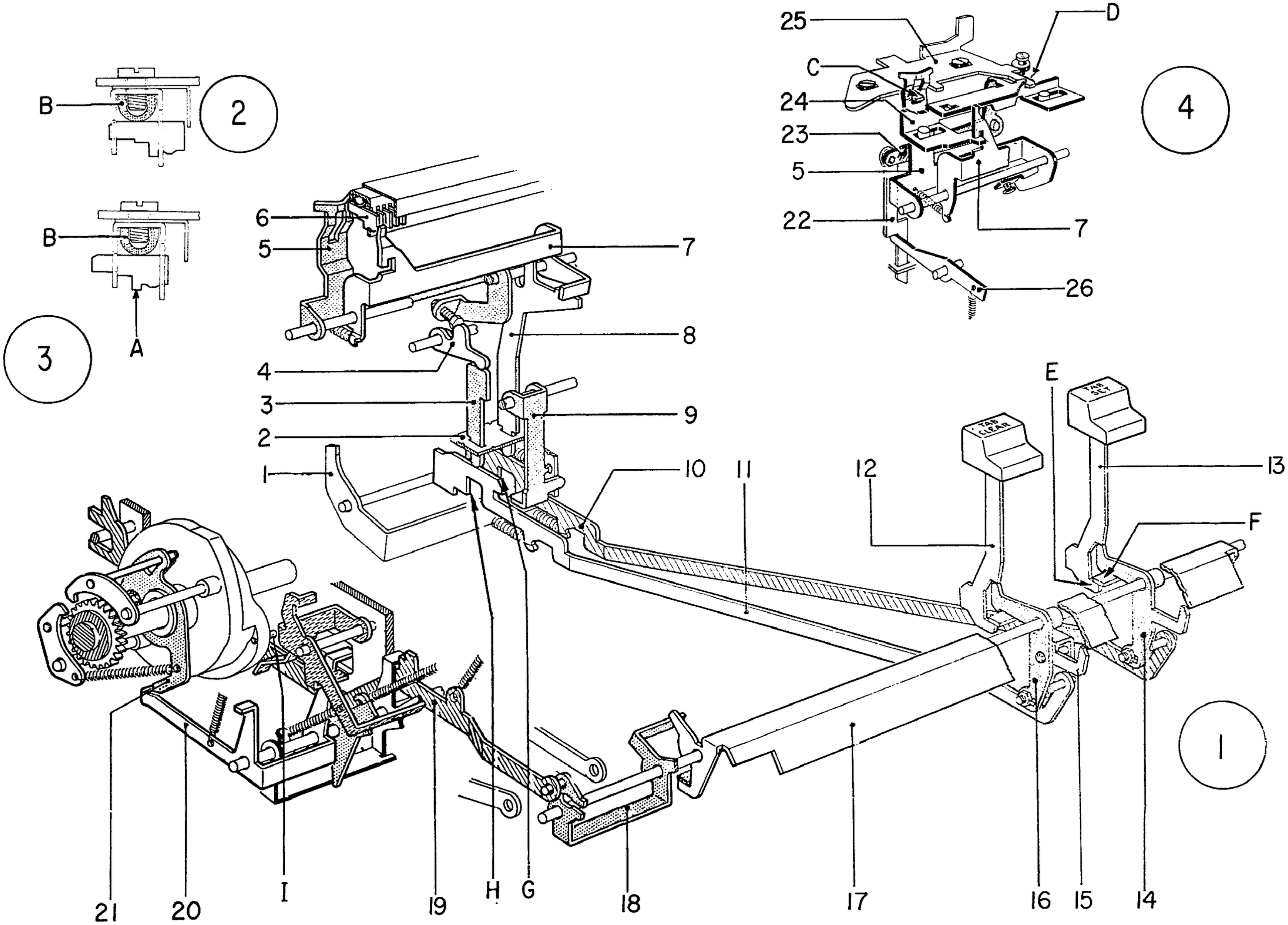
During the service cycle the universal bar (1) is rotated. Since the step (G) is in the path of the universal bar (1), the activating link (10) is raised. This movement raises the plunger (8), and rotates the setting finger (7), which pushes the tabulator stop (6) into the set position, as shown in figure 3. The setting finger actuated by the service cycle will immediately return to rest, and the cycle will be complete. The service cam will only make one cycle regardless of whether the tab set key is held depressed or not, because the pin (I) of the cam will lower the trip link (19) during the cycle (as described in detail in Section 18, page 190).

When the tab clear key is depressed, the key stem (12) rotates the crank (16), which:

- Moves the activating link (11) forward, placing its step (H) in the path of the universal bar (1).
- Through the release lever (15), rotates the service cam activating bail (17) and the command bridge (18). The rotation of the command bridge moves the trip link (19) rearward, allowing the service cam clutch to engage.

During the service cycle the universal bar (1) is rotated. This movement raises the activating link (11) and the plunger (3) which, through the intermediate crank (4), rotates the tab clear finger (5). The tab clear finger will push the tabulator stop (6) into the position shown in figure 2. When the tab clear key is held depressed, the tab clear finger remains in the active position. This is due to the latch (9) which, through the tension of its spring, engaged in the recess of the activating link (11) when the activating link was raised.

The operator can thus clear all set tab stops in one operation by using the tab clear key in conjunction with the tabulator bar or the carriage return key.


C
D
B
B
A
TAB CLEAR
TAB SET
E
F
I
H
G

TABULATOR BAR MECHANISM

When the tabulator bar is depressed the following occur:

- The tabulator action mechanism is preset.
- A service cycle starts.

During the first 90 degrees of the service cycle the tabulator mechanism must:

- Raise the tabulator stop blade to preset the stopping of the carriage.
- Disengage the escapement dog from the rack so the carriage can tabulate.
- Engage the centrifugal brake to control the speed of the carriage movement.

The service cycle is interrupted after 90 degrees of rotation of the service cam, to hold the tabulator mechanism in the working position until the carriage reaches the tab stop which has been preset. As the carriage tabulates, the set stop contacts the tabulator stop blade, which yields to the left. This leftward movement of the stop blade actuates the air-cylinder mechanism, which cushions the impact of the carriage as it is stopped. When the carriage reaches a set tab stop position, the escapement dog immediately re-engages with the escapement rack to hold the carriage at the position of the set tab stop. The service cam is also released from its 90-degree position and completes the balance of the cycle.

ASSEMBLY (REST POSITION)

Figure 5 shows the tabulator command mechanism in the rest position. The projection (B) of both stems (13) rest against the rubber stop (A) through the tension of spring (8). This establishes the rest position for the activating link (12), the frame (15), and the tabulator bar (14). The spring (19), through the trip link (18) and command bridge (17), holds the service cam activating bail (16) at rest, with its extension (D) against the rubber stop (C).

The intermediate bridge (1) rests, through spring tension, with its arm (E) on the wing (F) of the block-out arm control lever (2). The wing (F) of the block-out arm control lever, in turn, rests on the step (G) of the trip latch (20). The starting lever (3) rests against the sidewall of the machine, and in this position holds the flange (4), keeping the service cam clutch disengaged.

The activating link extension (10) is attached to the activating link (12), and is held in a forward position on the link (12) by spring (11).

The latch slide (7) is attached to the extension (10) by two pins, and is held in a forward position on the extension by spring (9).

The tabulator bar hold down latch (6) rests on top of the activating link extension (10), through the tension of spring (5).

> Note. The function of the tabulator bar hold down latch will be described in the "reverse tabulation" portion of this section.

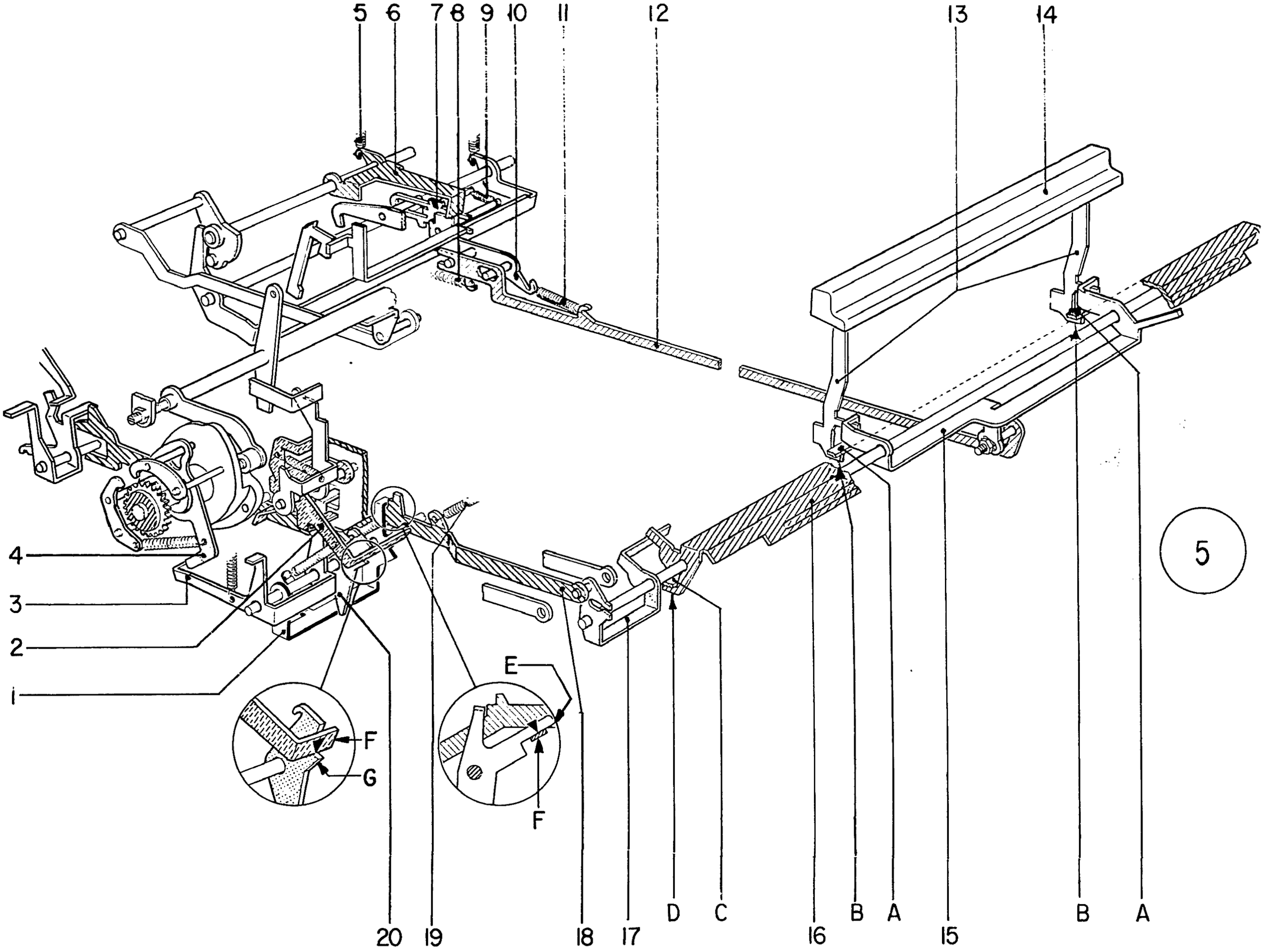
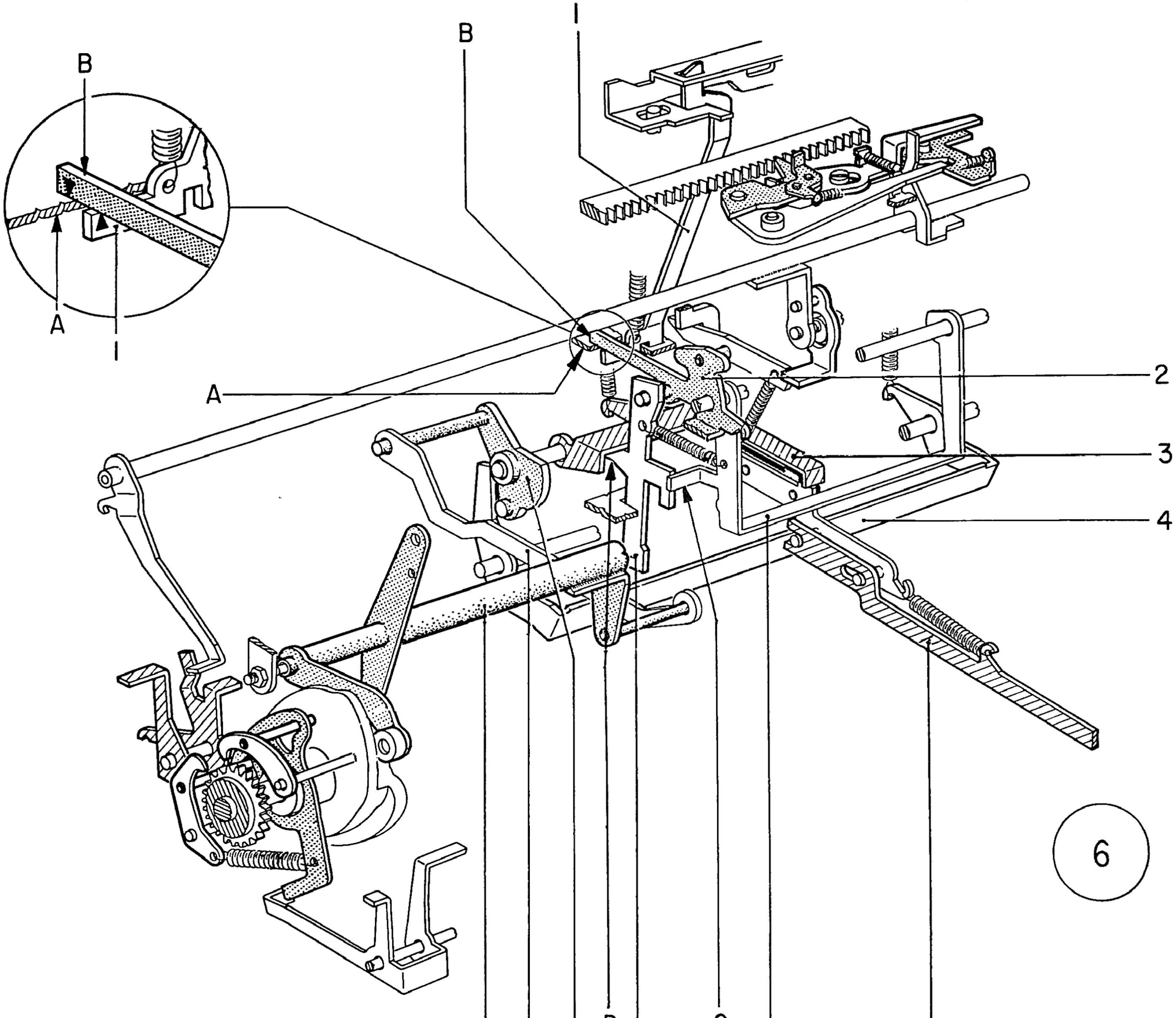

F
G
E
F
D
C
B
A
B
A

Figure 6 shows the tabulator action mechanism in the rest position.

The activating link (5) being at rest, establishes the rest position of the bail (6). The wing (C) of the bail (6) holds the plunger (7) to the rear and out of the path of the universal bar (4).

The extension (D) of the plunger (7) is located under the tabulator bar hold down latch (3). The extension (B) of the escapement release bridge (2) rests on the plate (A) under the tension of its spring (not shown in the illustration). The extension (B) also holds the tabulator stop blade (1) down at rest, against the tension of the tabulator stop blade spring. The rest position of the universal bar (4), through the tension of its spring, is determined by the rocker (8), link (9) and the roller of the reset frame shaft (10) resting on the inner profile of the service cam group.


B
A
B
A
C
D
D
C

COMMAND MECHANISM

There are two distinct positions to which the tabulator bar can be depressed:

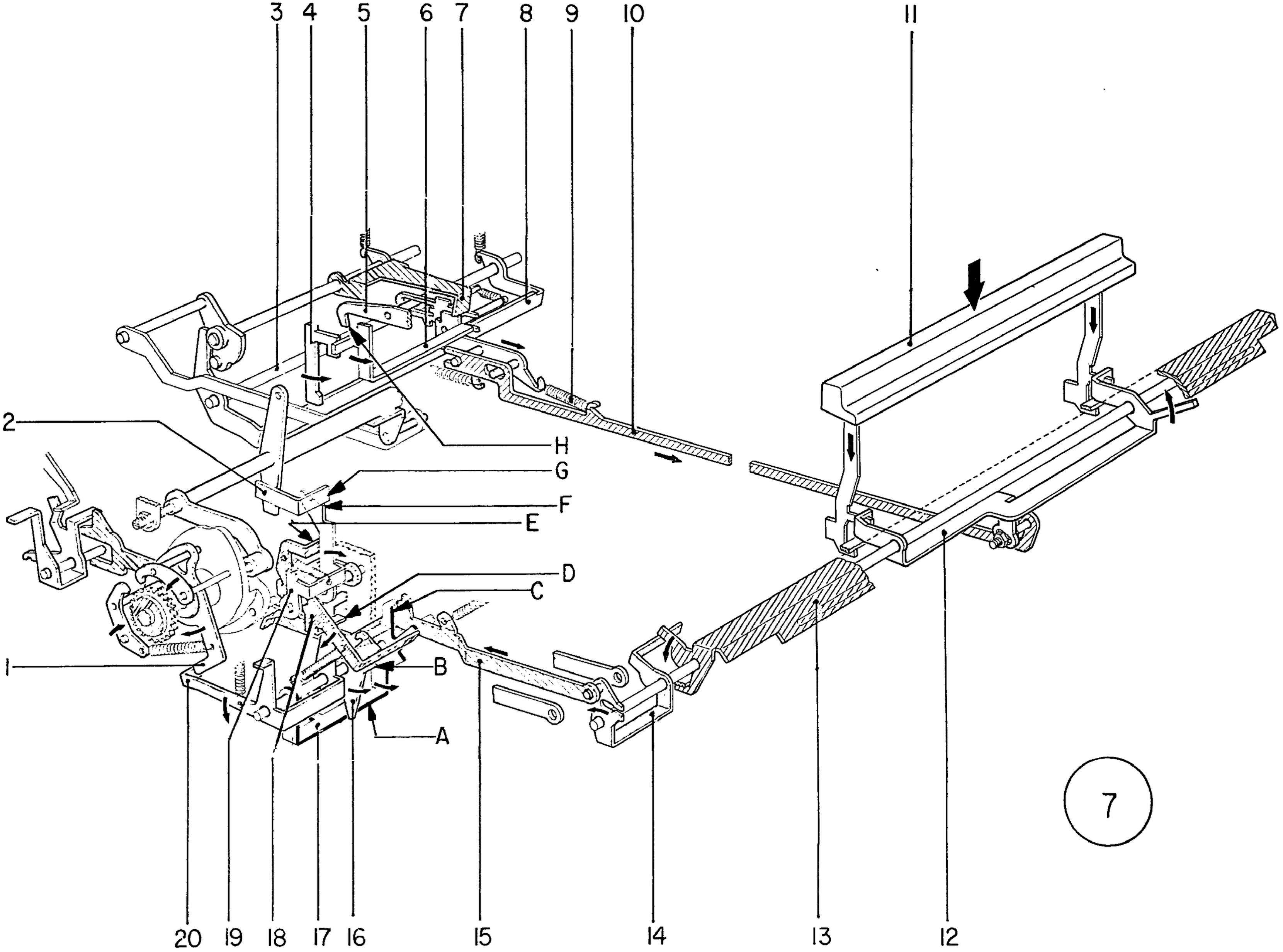
- Normal depression - for single tabulation
- Full depression - for repeat tabulation

When the tabulator bar (11) is depressed to the normal position, its downward travel is stopped when the hook (H) of the extension (5) contacts the shaft (3). When the tabulator bar (11) is fully depressed to repeat position, the hook of the extension (5) limits against the shaft (3), but the activating link (10) continues to move forward, and the coupling spring (9) yields.

When the tabulator bar is depressed to either the normal or fully depressed position, the frame (12) rotates the service cam activating bail (13) in the direction of the arrow. This movement, through the command bridge (14), moves the trip link (15) rearward. The lower step (C) of the trip link rotates the intermediate bridge (17), the beam (A) of which, in turn, rotates the trip latch (16). The rotation of the trip latch causes its step (B) to release its hold on the block-out arm control lever (18) which, under the tension of its spring, rotates in the direction of the arrow. The rotation of the block-out arm control lever (18) performs two functions. First, the wing (E) rotates the block-out arm (19) so that its upper step (F) is directly in the path of the wing (G) of the backspace activating lever (2). Simultaneously, the wing (D) of the block-out arm control lever (18) rotates the starting lever (20), causing it to release its hold on the flange (1) and allowing the clutch to engage.

The depression of the tabulator bar (11) to the normal position also moves the activating link (10) forward until the hook (H) of the extension (5) limits against the shaft (3). The forward movement of the activating link rotates the bail (6), allowing the plunger (4) to move forward into the path of the universal bar (8).

> Note. The function of the tabulator bar hold down latch (7) is covered in detail in the "reverse tabulation" portion of this section.



⑦

Activation.

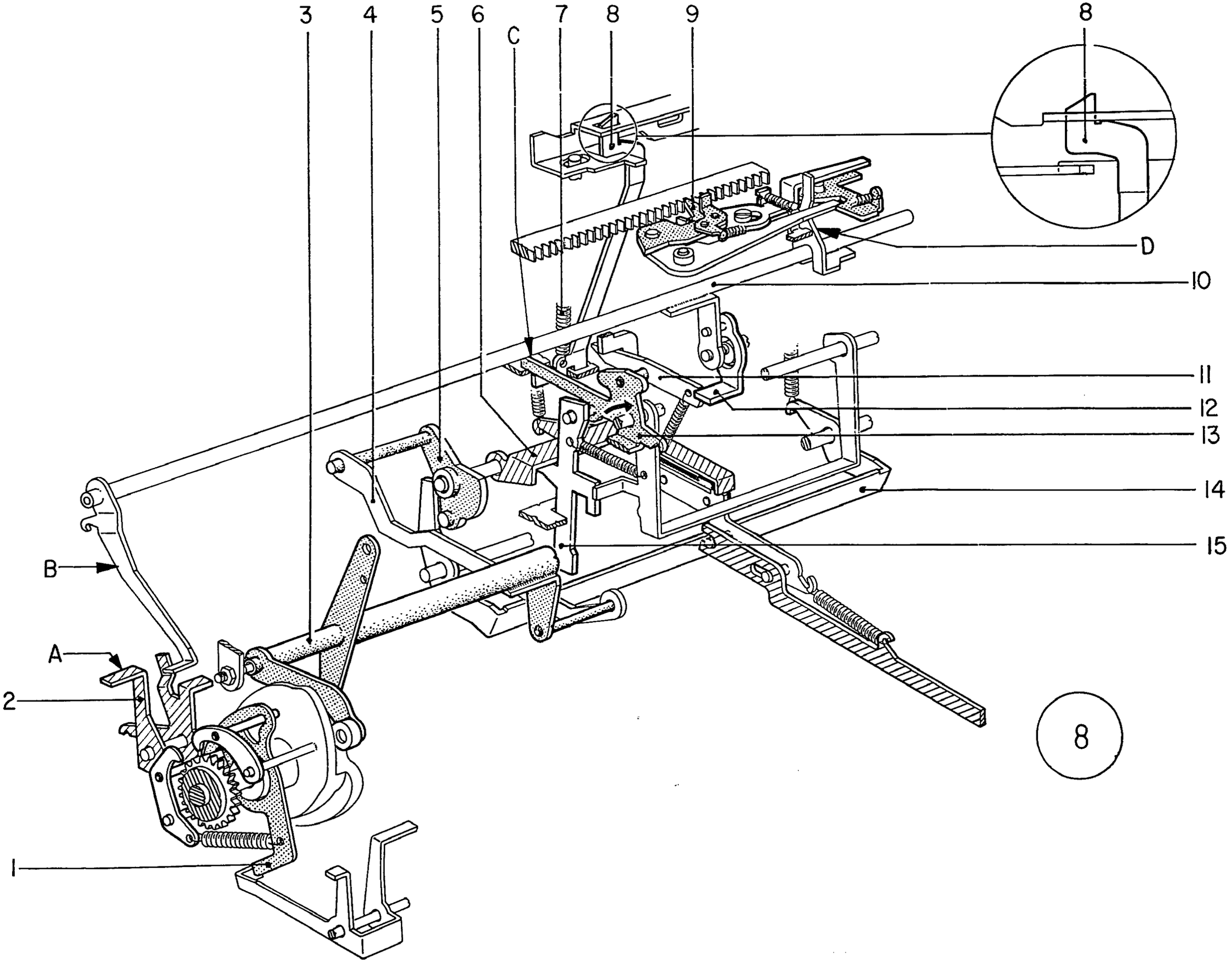
The depression of the tabulator bar has resulted in the positioning of the plunger (15) in the path of the universal bar (14), and the starting of a service cycle.

During the service cycle, through the parts (3), (4), and (5), the universal bar (14) is raised. This movement raises the plunger (15), which rotates the latch (6) and the escapement release bridge (13) in the direction of the arrow. The extension (C) of the release bridge (13), in rotating, allows the spring (7) to raise the tabulator stop blade (8). (See inset drawing.) The rotation of the escapement release bridge (13) also causes the escapement control arm (11) to move forward and rotate the crank (12). The movement of the crank rotates the escapement dog supplementary release frame (10) causing the arm (D) of the release frame to disengage the escapement dog (9) from the rack. At the same time, the arm (B) of the release frame (10) allows the 90-degree stop lever (2), through its spring, to rotate so that its wing (A) will stop the flange (1) and disengage the clutch after 90 degrees of rotation. The rotation of the escapement release bridge (13) also allows the centrifugal brake to engage. (The centrifugal brake mechanism is described later in this section.)

The carriage is now free to tabulate with:

- The tabulator stop blade raised.
- The escapement dog released.
- The centrifugal brake engaged.

The above mechanism will be held in the active position until a set tab stop contacts the tabulator stop blade.



8

Stopping of Tabulation (By Tab Stop).

When a set tab stop (5) contacts the tabulator stop blade (4), both the stop blade and the guide plate (3) are pushed to the left. The leftward movement of the guide plate (3) causes the following:

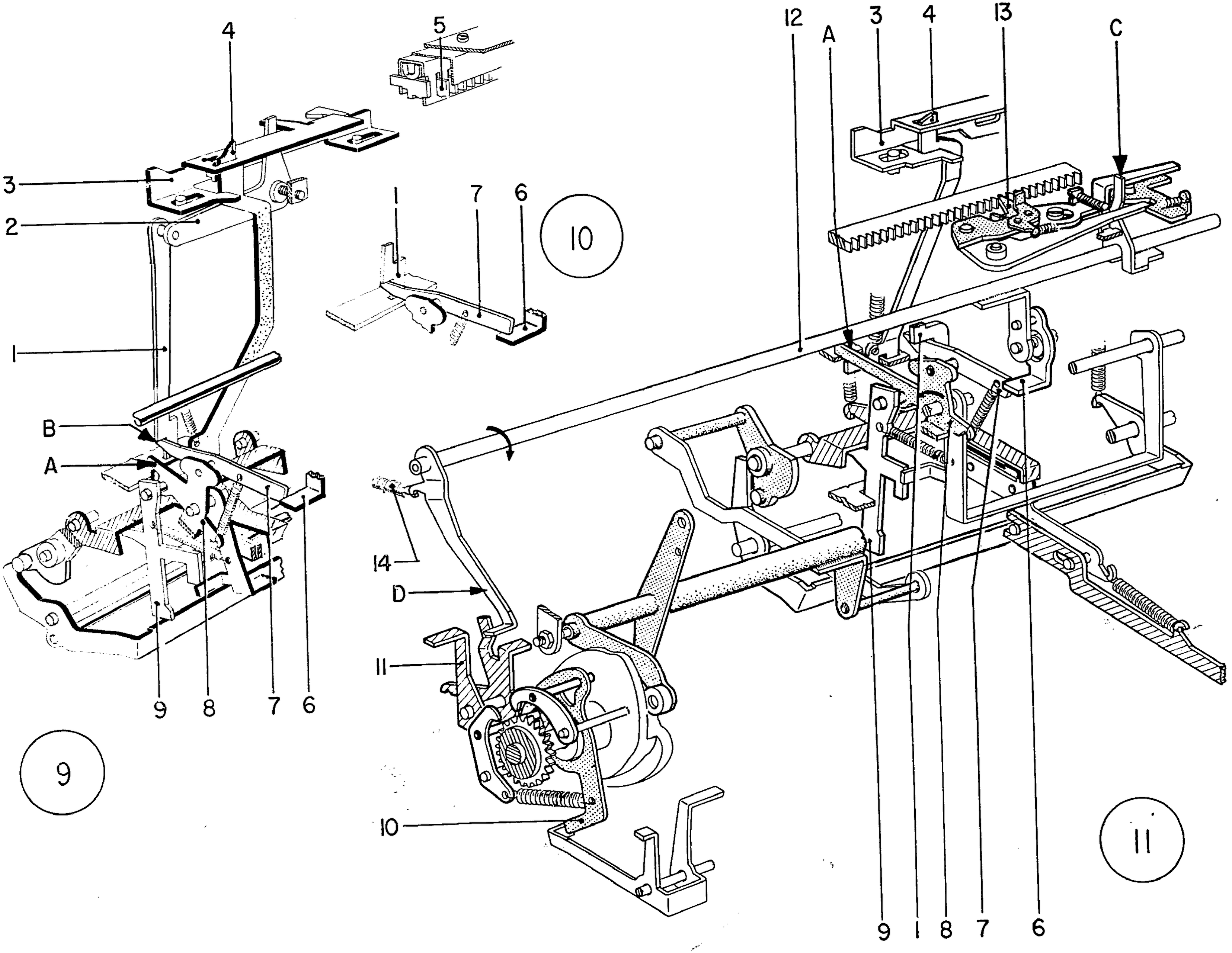
- Actuation of the air cylinder to cushion the stopping of the carriage. (For detailed operation of the air cylinder, refer to Section 22.)
- The re-engagement of the escapement dog with the rack to hold the carriage in position.
- Release of the service cam from the 90-degree position so that the cam can complete the cycle and allow the mechanisms to return to rest.

When the stop blade (4) and the guide plate (3) are moved to the left by the set tab stop, the guide plate (3) rotates the crank (2). The crank rotation lowers the link (1), and the step (B) of the link rotates the escapement control arm (7), figure 9. This causes the control arm to release its hold on the crank (6), as shown in figure 10. When the crank (6) is released, the spring (14) restores the escapement dog supplementary release frame (12), figure 11.

As the escapement dog supplementary release frame restores, the following occurs (refer to figure 11):

- The arm (C) of the release frame allows the escapement dog (13) to re-engage the rack.
- The arm (D) of the release frame rotates the 90-degree stop lever (11), causing it to release its hold on the flange (10).
- The service cam completes the cycle.
- During the completion of the cycle, the spring of the escapement release bridge (not shown in the figure) rotates the release bridge (8) in the direction of the arrow. This rotation lowers the plunger (9) and, at the same time, the extension (A) of the release bridge (8) lowers the stop blade (4) to rest.

The tabulation cycle has been completed, with the carriage having traveled quickly and quietly to a tab stop position.


B
A
A
C
D

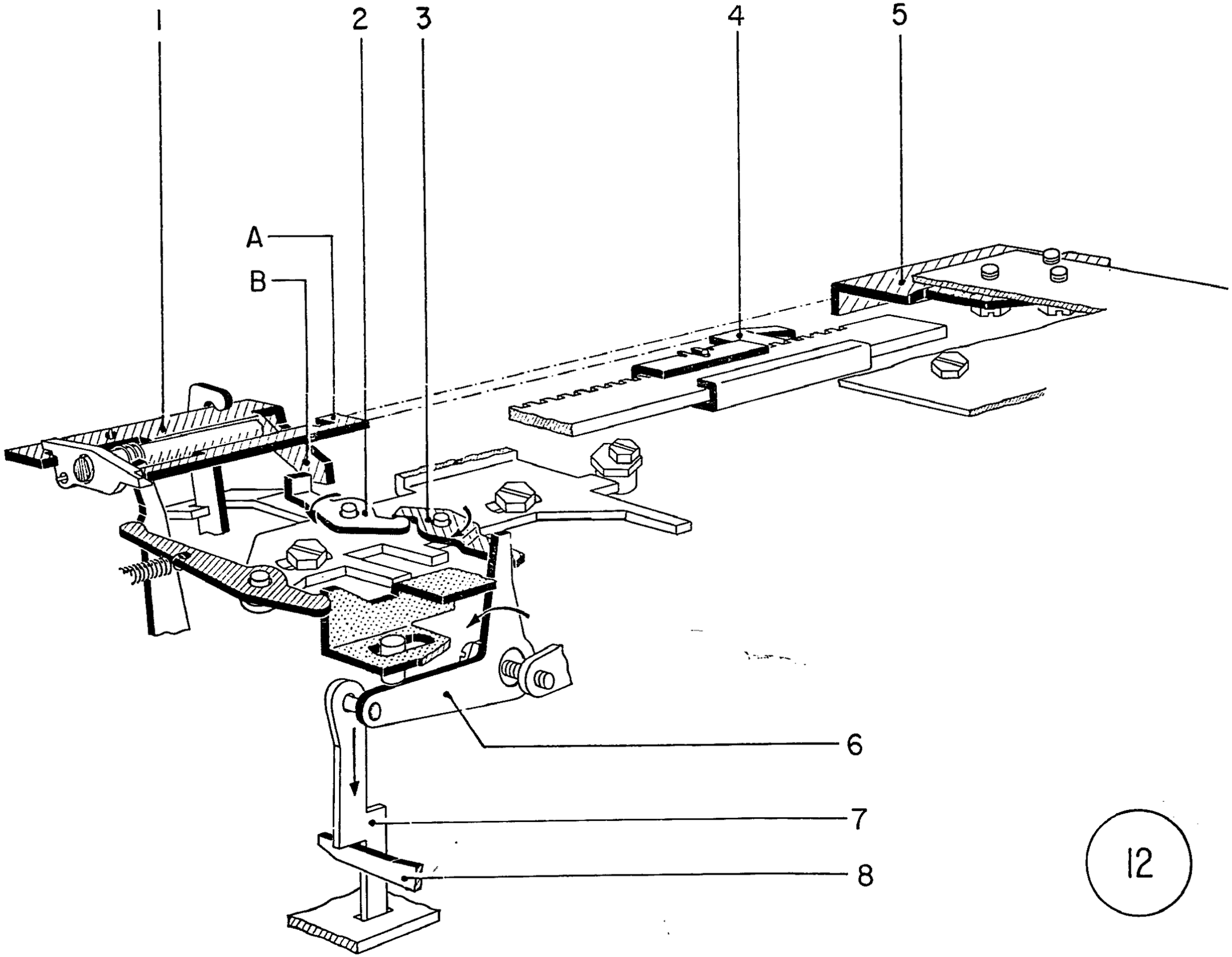
Stopping of Tabulation (By Right-Margin Stop or Right Limit Stop).

If the tabulator bar is depressed after the last set tab stop, the tabulation of the carriage will eventually be stopped by either:

- The right margin stop.
- The right limit stop.

When tabulation is stopped by the right margin stop, the wing (4) of the right margin stop contacts the extension (A) of the control plate (1) and drives it to the left. Through this movement, the extension (B) rotates the two rockers (2 and 3) and crank (6) in the direction of the arrows. The link (7) is lowered, and the escapement control arm (8) restores the tabulator mechanism in the usual way, as described on the previous page.

The same action described above takes place when tabulating into the right limit stop (5), except that the limit stop contacts the control plate (1) rather than the wing (4) of the margin stop.



12

Centrifugal Brake.

The centrifugal brake controls the speed of the carriage during tabulation, and results in the braking action being directly proportional to the speed of the carriage.

Assembly (Rest Position).

Figures 13 and 14 show the centrifugal brake mechanism at rest position. In this position the extension (A) of the escapement release bail (5) holds the centrifugal brake frame (6) rotated in a clockwise direction, and the gear (10) is disengaged from the main spring drum gear (9).

The extension (C) of the antirelease dog (11) rests on the universal bar control link (3) through tension of the spring (12).

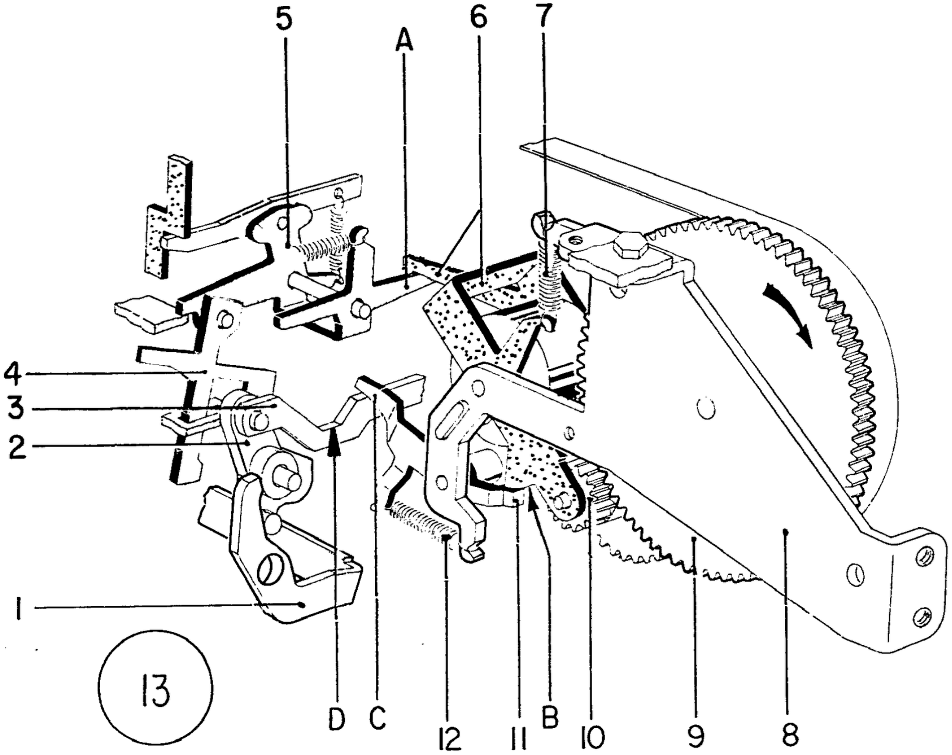
Figure 15 shows an exploded view of the centrifugal brake which consists of the following parts:

- The tabulator brake drum (13), which is keyed to the bracket (8).
- The brake shoes (14) with felt pads (16), which pivot on the pins (E) of the flange (15).

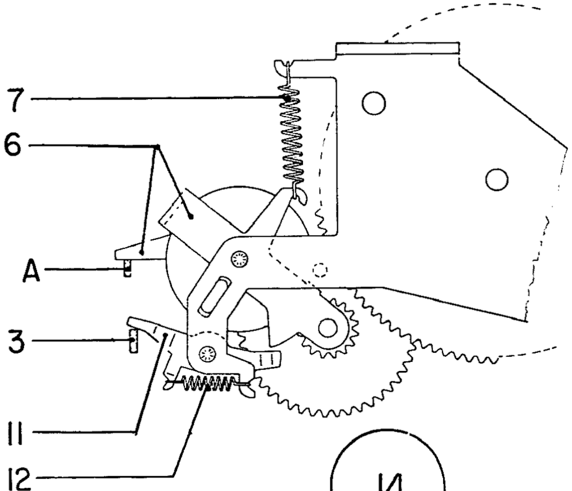
Activation.

When a tabulation cycle is performed, the following action takes place (figure 13):

- The universal bar control link (3) moves forward, and the dwell (D) of the link positions under the extension (C) of the antirelease dog (11). The dog rotates slightly until its lower portion limits against the frame (6) as at B.
- The crank (2) rotates the universal bar (1), causing the plunger (4) to rise and rotate the escapement release bail (5). As the extension (A) of the bail leaves the frame (6), the latter rotates through the tension of the spring (7), and the gear (10) engages with the main spring drum gear (9), as shown in figure 16.
- When the frame (6) rotates, the antirelease dog (11) rotates behind the lower portion of the frame as at (F) in figure 16, the gear (10) is held securely engaged with the drum gear (9). (The gear (10) must be locked in engagement with the drum gear (9) to prevent the gear (10) from self-releasing, and causing a grating sound when the carriage is returned during an "express margin" operation.)
- When the carriage tabulates, the main spring drum gear (9) turns in the direction of the arrow (figure 13). Through this rotation, the gear train rotates the flange (15) and, in turn, the brake shoes (14), figure 15. The braking action is obtained by the pressure of the felt pads (16) exerted against the inner surface of the brake drum (13) through centrifugal force.



13



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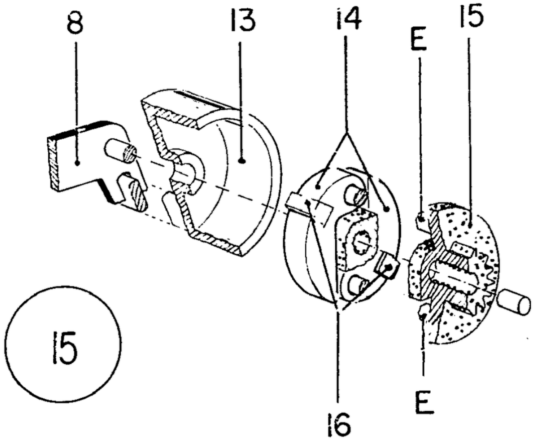
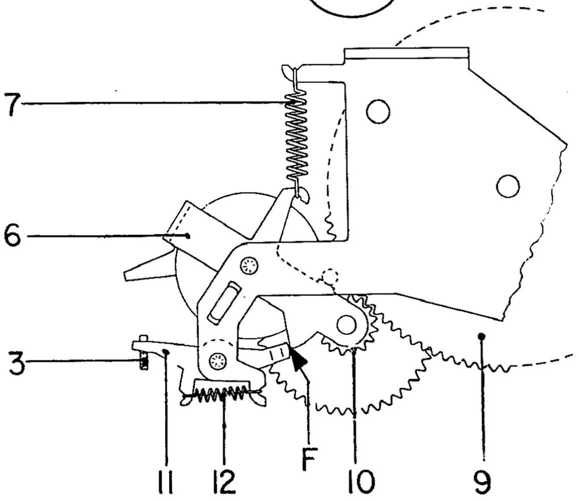


15

16



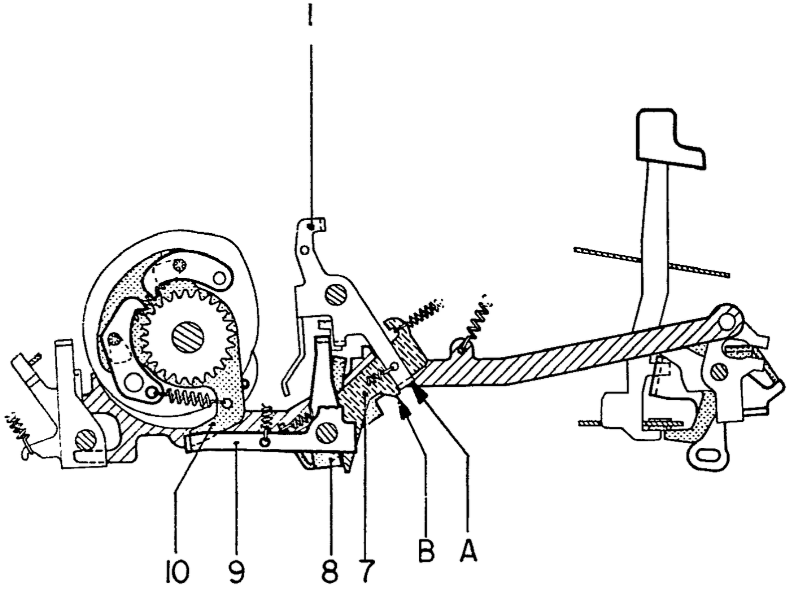
Command Mechanism During Normal Depression of Tabulator Bar.

When the tabulator bar is depressed to the normal position, the service cam makes only one cycle, regardless of whether the tabulator bar is held depressed or not.

The following figures show various positions of the tabulator command mechanism following normal depression of the tabulator bar.

Figure 17 shows the tabulator command mechanism in its rest position. The flange (10) is held by the starting lever (9), which is resting under spring tension against the sidewall of the machine. The wing (A) of the block-out arm control lever (1) is resting on the step (B) of the trip latch (7). The intermediate bridge (8), in turn, rests on the wing (A) of the control lever (1).

Figure 18 shows that the tabulator bar has been depressed to its normal position. The stem (3) of the tabulator bar, through the frame (4), has rotated the service cam activating bail (6) and the command bridge (5). This has moved the trip link (2) rearward, causing the step (C) to rotate the intermediate bridge (8) in the direction of the arrow. The intermediate bridge, in turn, has rotated the trip latch (7), causing it to release its hold on the wing (A) of the block-out arm control lever (1). Through the action of its spring, the control lever (1) has rotated, causing its wing (D) to rotate the starting lever (9), thus releasing the flange (10).



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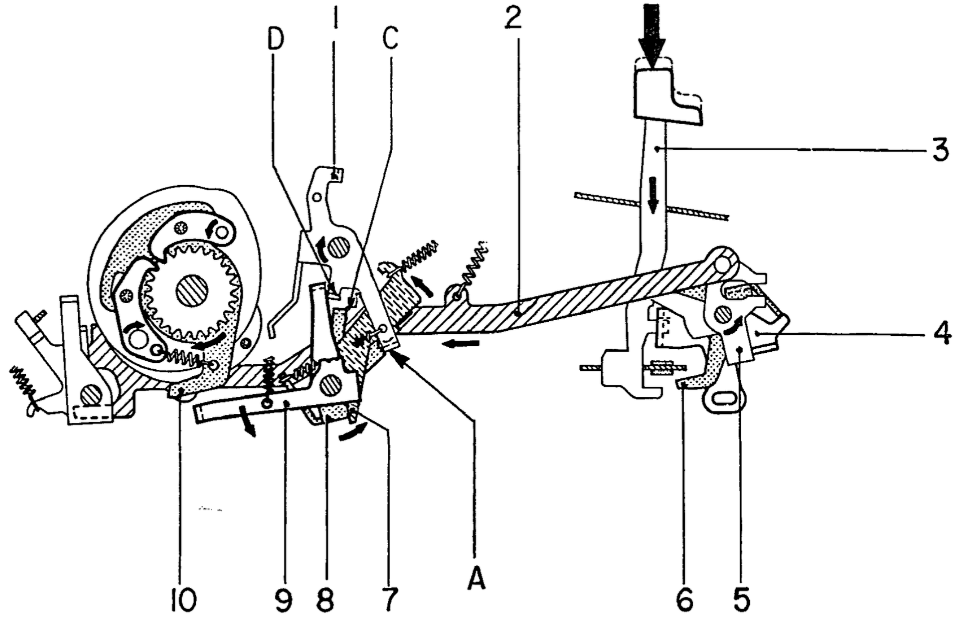
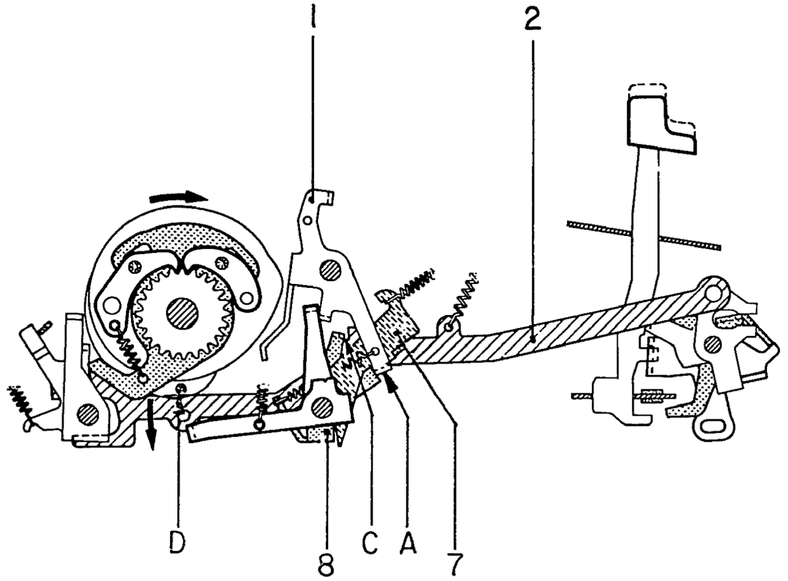


18

Figure 19 shows that as the cam starts to rotate, the stud (D) lowered the rear of the trip link (2). This movement has caused the step (C) of the trip link to lose contact with the wing of the intermediate bridge (8). This has allowed the spring to return the intermediate bridge to rest, and the trip latch (7) to restore until stopped by the wing (A) of the block-out arm control lever (1).

Figure 20 shows the cam at approximately 180 degrees of the cycle. The inner profile of the cam has restored the block-out arm control lever (1). This movement allowed the trip latch (7) to fully restore, and its step (B) is again in position to hold the wing (A) of the control lever (1). As the cam profile restored the control lever, the starting lever (9), through the action of its spring, was restored against the sidewall of the machine. The starting lever is, therefore, preset to stop the rotation of the service cam after one complete cycle.



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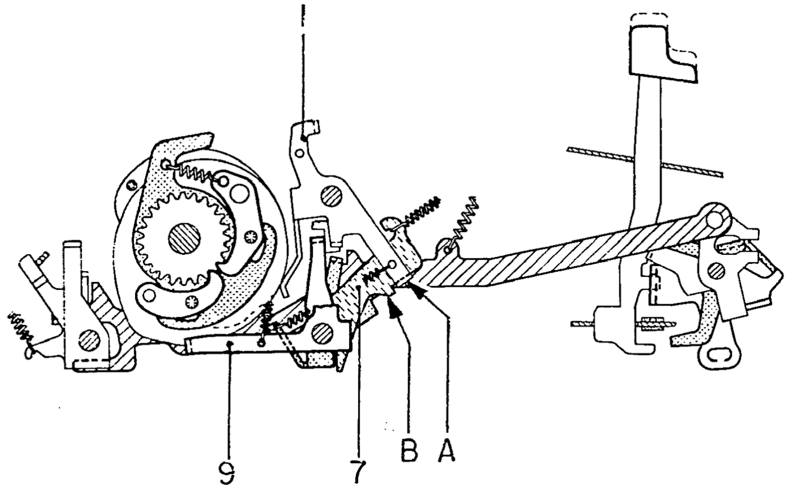


20

Command Mechanism During Full Depression of Tabulator Bar.

When the tabulator bar is fully depressed, the starting lever is prevented from restoring, resulting in successive cycles of the service cam. Therefore, the tabulator cycles will repeat (skip tabulation) until the tabulator bar is released.

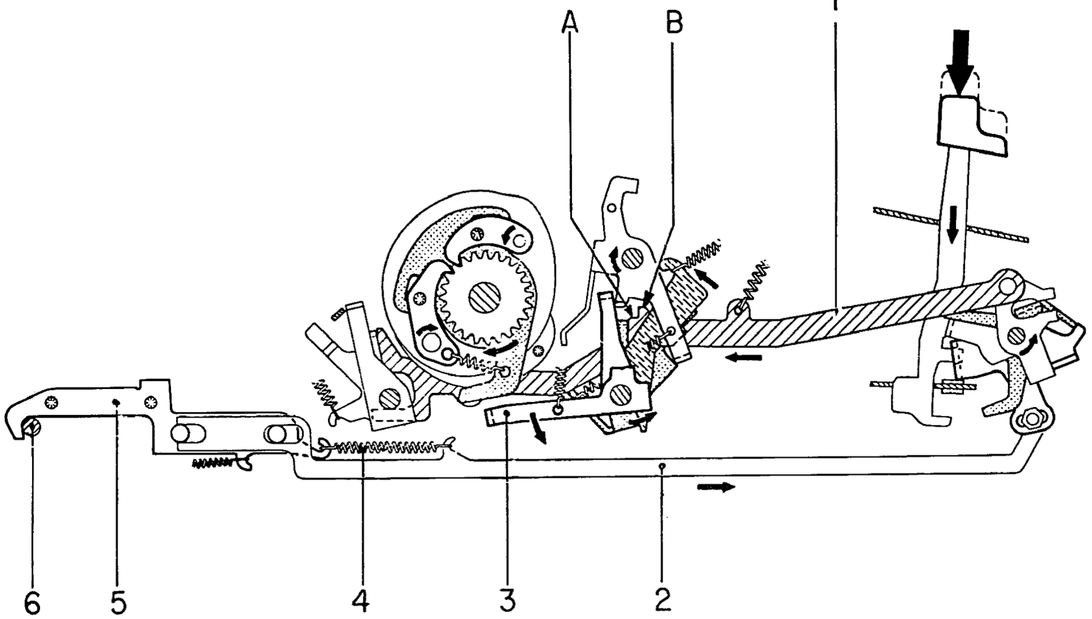
Figure 21 shows that the tabulator bar has been fully depressed. With the tabulator bar in this position, the following conditions exist:

- The trip link (1) has moved to the left a greater amount than when the tabulator bar was depressed normally. Consequently, the step (A) of the trip link has rotated the starting lever (3) a greater amount.
- The hook of the activating link extension (5) limited against the shaft (6), while the extra travel of the activating link (2) caused the spring (4) to yield.

Figure 22 shows how the starting lever is prevented from restoring during the service cycle, when the tabulator bar is held fully depressed.

As the service cam starts to rotate, the stud (E) lowers the trip link (1) causing its step (A, figure 21) to lose contact with the wing (D) of the intermediate bridge (8). It should be noted that the intermediate bridge is unable to return to rest position because its wing (D) is now being held by the upper step (B) of the trip link (1). The trip latch (7) will remain in the position shown in figure 22 and not in position to latch the wing (C) of the backspace block-out arm control lever (9) when the latter is restored by the service cam.

After the control lever (9) reaches maximum restoration, the service cam allows it, together with the starting lever (3), to assume the position shown in figure 22. The starting lever will again be released, and will not be in position to stop the service cam at the end of the cycle.



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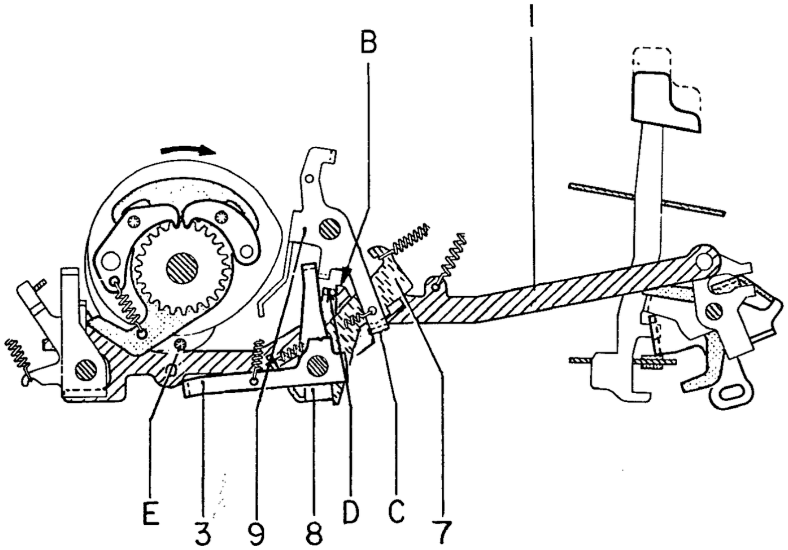


22

Stopping Tabulation With Back Space Key or Tabulator Bar.

During a tabulation operation the carriage can be stopped, whenever desired, by depressing either the back space key or the tabulator bar.

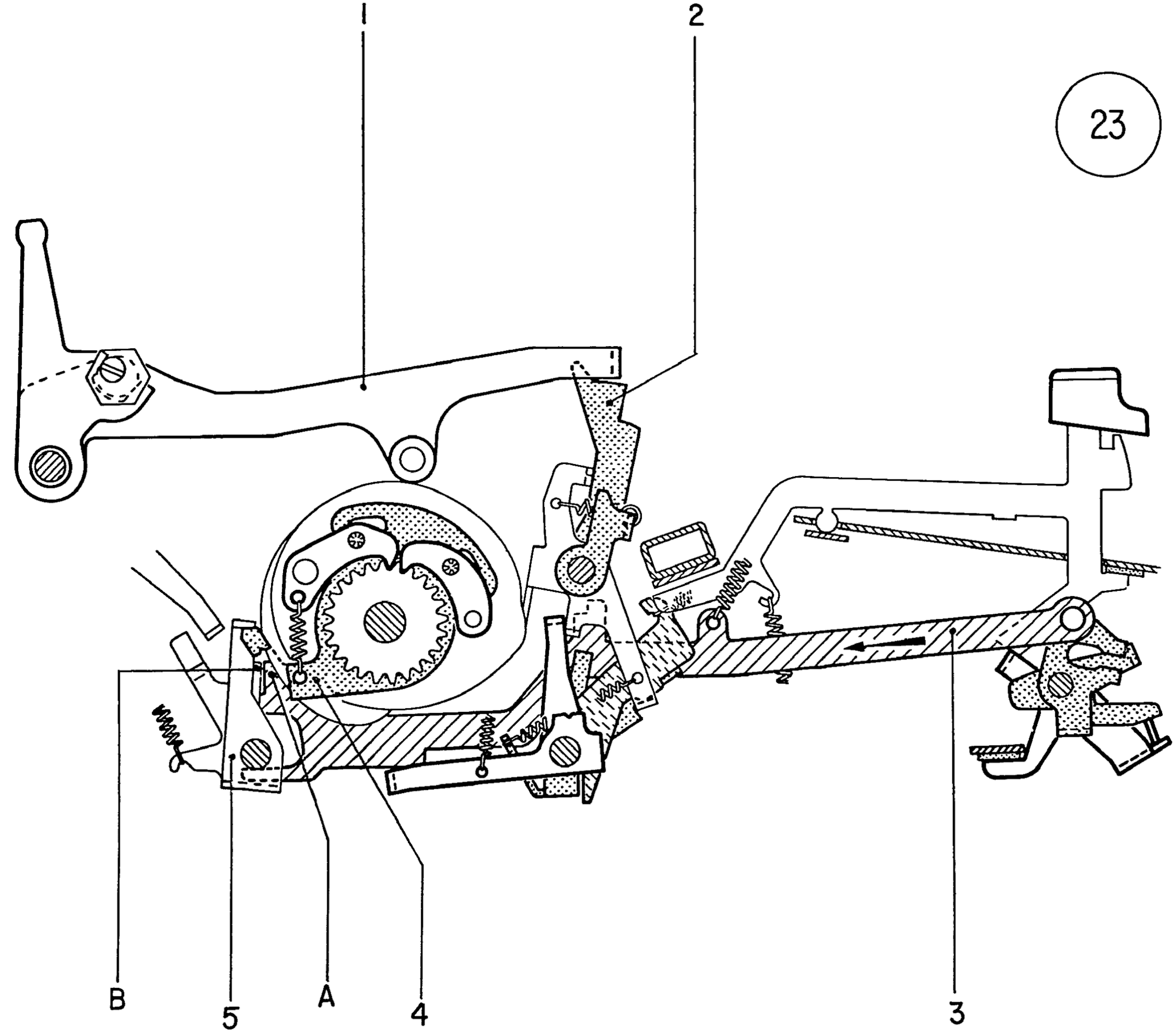
Stopping tabulation with the back space key.

Depression of the back space key during a tabulation operation immediately stops the carriage without activating a backspace cycle.

Figure 23 indicates that a tabulation operation is in progress. The service cam is stopped at 90 degrees of rotation by the 90-degree stop lever (5).

In this position the wing (B) of the 90-degree stop lever (5) is close to step (A) of the backspace trip link (3). Also, the backspace block-out arm (2) is in the path of the backspace activating lever (1). If the back space key is depressed at this time, the trip link (3) will move to the left, causing its step (A) to rotate the 90-degree stop lever (5). The rotation of the lever releases the flange (4), the service cam completes its cycle, and the tabulation of the carriage is immediately stopped.

A backspace operation could not take place because the block-out arm (2) has been preset in the path of the activating lever (1).


B
A

Stopping tabulation with the tabulator bar.

Normal depression of the tabulator bar during a tabulation operation immediately stops the tabulation of the carriage.

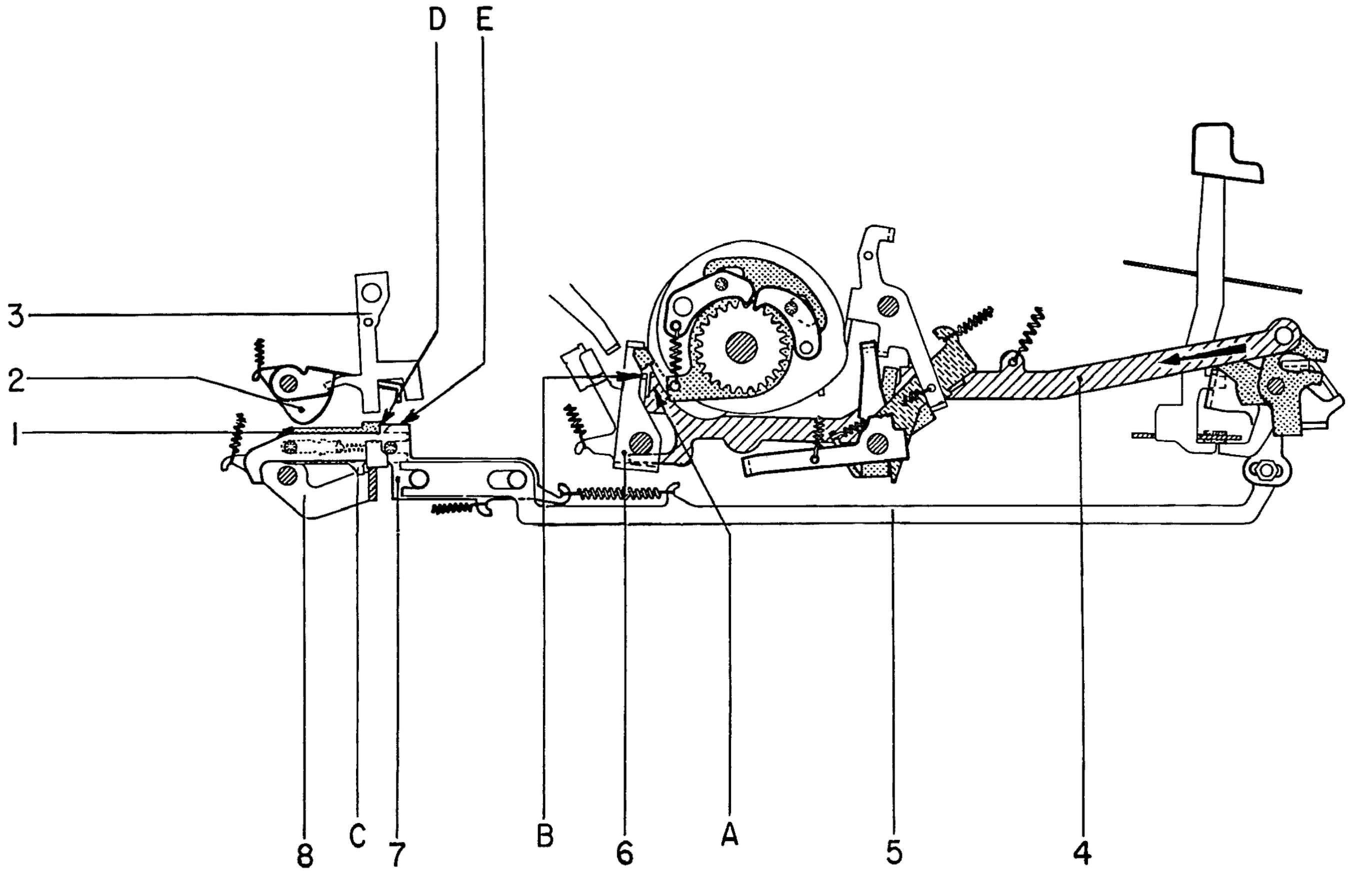
Figure 24 indicates that a tabulation operation is in progress. The service cam is stopped at 90 degrees of rotation by the 90-degree stop lever (6). The tabulator bar has been released, and restored to rest position. In this position the wing (B) of the 90-degree stop lever (6) is close to step (A) of the tabulator trip link (4).

If, during the tabulation cycle, the tabulator bar is depressed again, the trip link (4) will move to the left, causing its step (A) to rotate the 90-degree stop lever (6), releasing the service cam flange.

The service cam completes its cycle, and the tabulation of the carriage is immediately stopped.

It should be noted that when the tabulator bar was depressed the second time, the activating link (5) and its extension (7) moved to the right. The latch slide (1) was unable to follow the extension (7) because its tooth (C) was stopped by the universal bar (8). Therefore, an opening occurred between the two surfaces (D and E), but the latch (2) could not enter the opening, since the plunger (3), raised during the tabulation cycle, holds the latch (2) in the up position. Consequently, the tabulator bar is free to restore to rest position, and the service cam will stop at the completion of the cycle.

Note. The purpose of the latch (2) is described on the following pages.



24

Stopping of Carriage Return With Tabulator Bar.

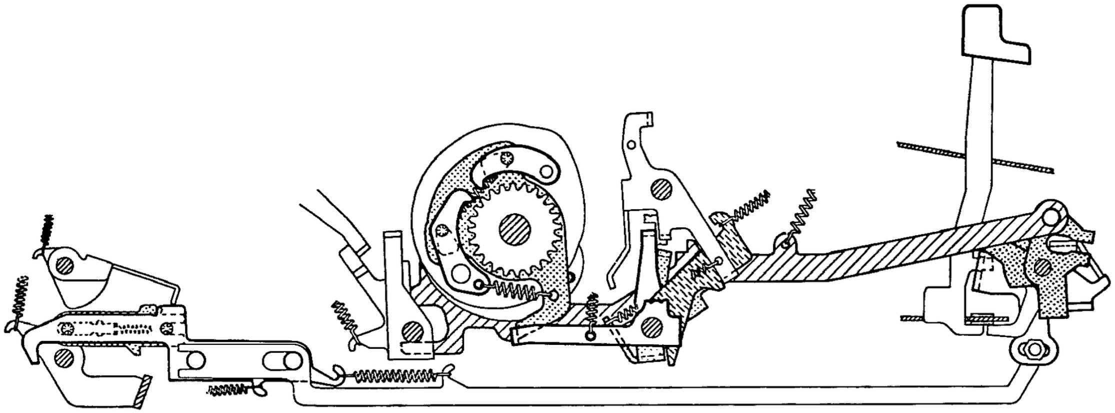
Depression of the tabulator bar during a carriage-return operation immediately stops the carriage from returning, and the carriage starts to tabulate. This feature is referred to as "reverse tabulation."

Figure 25 shows the tabulator command mechanism at rest position.

Figure 26 shows the relationship of the various parts of the tabulator command mechanism during a carriage return operation.

- The 90-degree stop lever (4) is holding the service cam at the 90-degree position.
- The wing (B) of the stop lever (4) has moved close to the step (A) of the trip link (3).
- The beam (2) of the universal bar has rotated into the path of the tooth (C) of the latch slide (1).

The figures on the following page illustrate the movement of the above mechanism when the tabulator bar is depressed.



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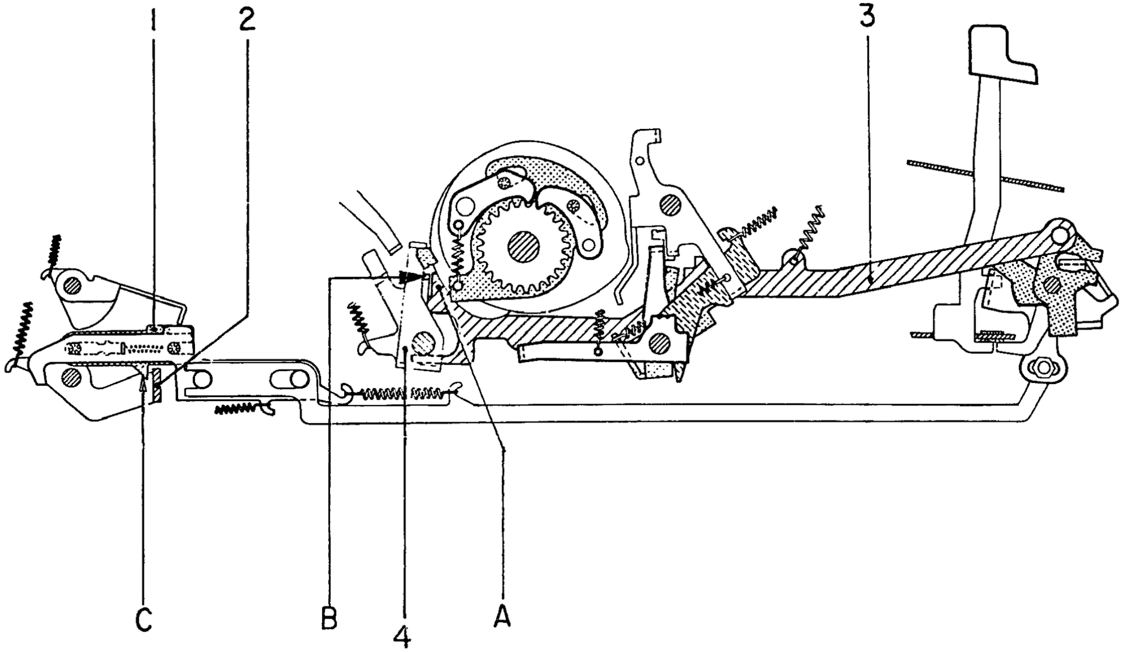

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Figure 27 shows that during the carriage return cycle the tabulator bar has been depressed.

Depression of the tabulator bar caused the trip link (3) to move to the left and, in turn, rotated the 90-degree stop lever (4). The service cam can now complete the cycle, and the carriage return operation will stop. At the same time that the trip link (3) moved to the left, the tabulator bar activating link (5) moved to the right, together with its extension (6).

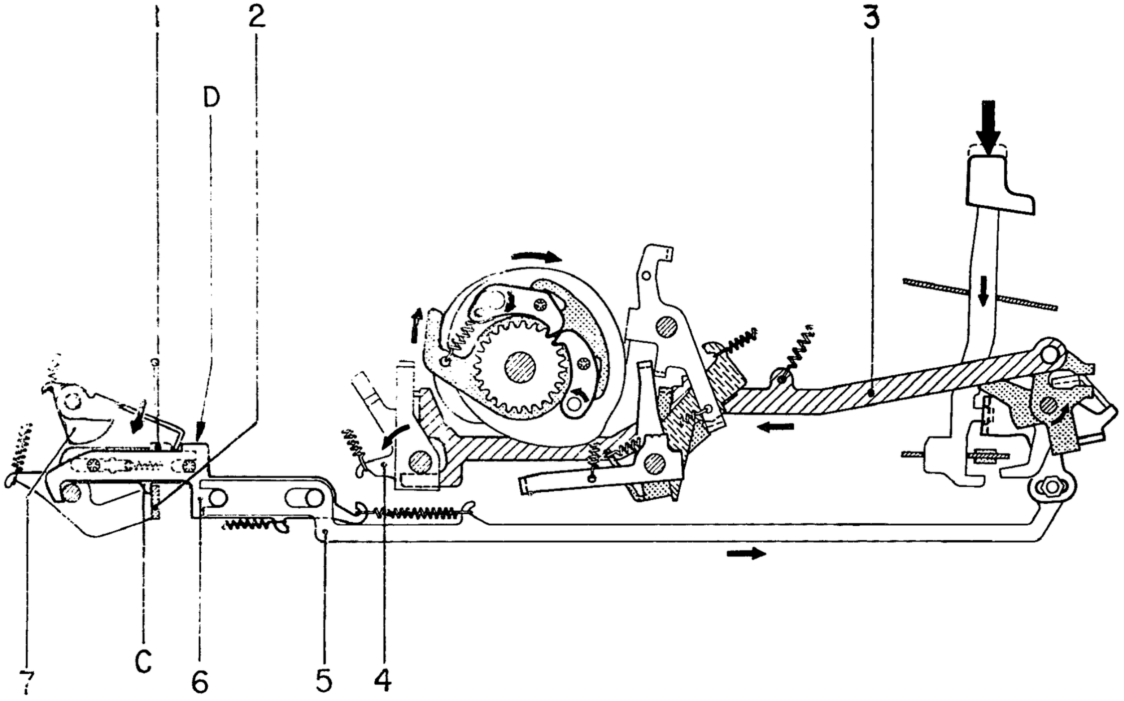
The latch slide (1) attempts to move to the right with the extension (6), but is immediately stopped by its tooth (C) contacting the beam (2) of the universal bar. Therefore, as the surface (D) of the extension moved to the right, the latch (7) engaged between the extension (6) and the latch slide (1).

In this position, the latch (7) holds the activating link (5) and the tabulator bar in the active position, thus presetting the starting of a tabulation cycle immediately after the carriage return cycle ends.

Figure 28 shows that the service cam has completed the carriage return cycle, and is free to start the tabulation cycle since the tabulator bar is held down by the latch (7).

During the tabulation cycle, the rotation of the universal bar (5) pushes the plunger (8) up, and its extension (E) rotates the tabulator bar hold down latch (7) in the direction of the arrow. The latch (7) releases its hold on the activating link extension, and the tabulator bar restores to rest position, thus presetting the stopping of the cam at the completion of the tabulation cycle.

> Note. The premature stopping of the carriage during a carriage return operation should only be done with the tabulator bar. If the back space key is used, the carriage return operation will also be stopped, but the backspace pawl will cause a grating sound as it engages with the escapement rack.



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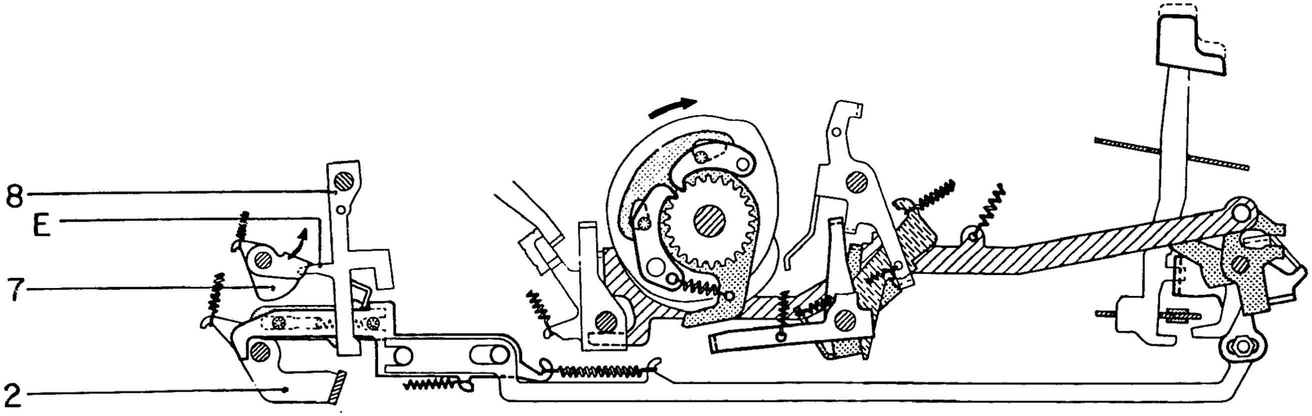


28

ADJUSTMENTS

Before performing the adjustments of the tabulation mechanism, the following three adjustments should be verified for correct operation.

BACKSPACE BLOCK-OUT ARM CLEARANCE ADJUSTMENT

This adjustment is covered on page 214 of Section 19 (Half Space Section).

BACKSPACE BLOCK-OUT ARM (REST POSITION) ADJUSTMENT

This adjustment is covered on page 196 of Section 18 (Backspace Section).

BACKSPACE BLOCK-OUT ARM CONTROL LEVER RESTORE ADJUSTMENT

This adjustment is covered on page 266 of Section 21 (Margins and Associated Mechanisms).

TABULATOR STOP RACK ADJUSTMENT

The tabulator stop rack is attached to the carriage frame, and is laterally adjustable in relation to the escapement rack.

Detailed specifications for setting the tabulator stop rack are described in Section 29 (Positions of Escapement Rack, Margin Stop Rack, and Tabulator Stop Rack), page 406.

TABULATOR SET AND CLEAR ACTIVATING LINKS (REST POSITION) ADJUSTMENTS

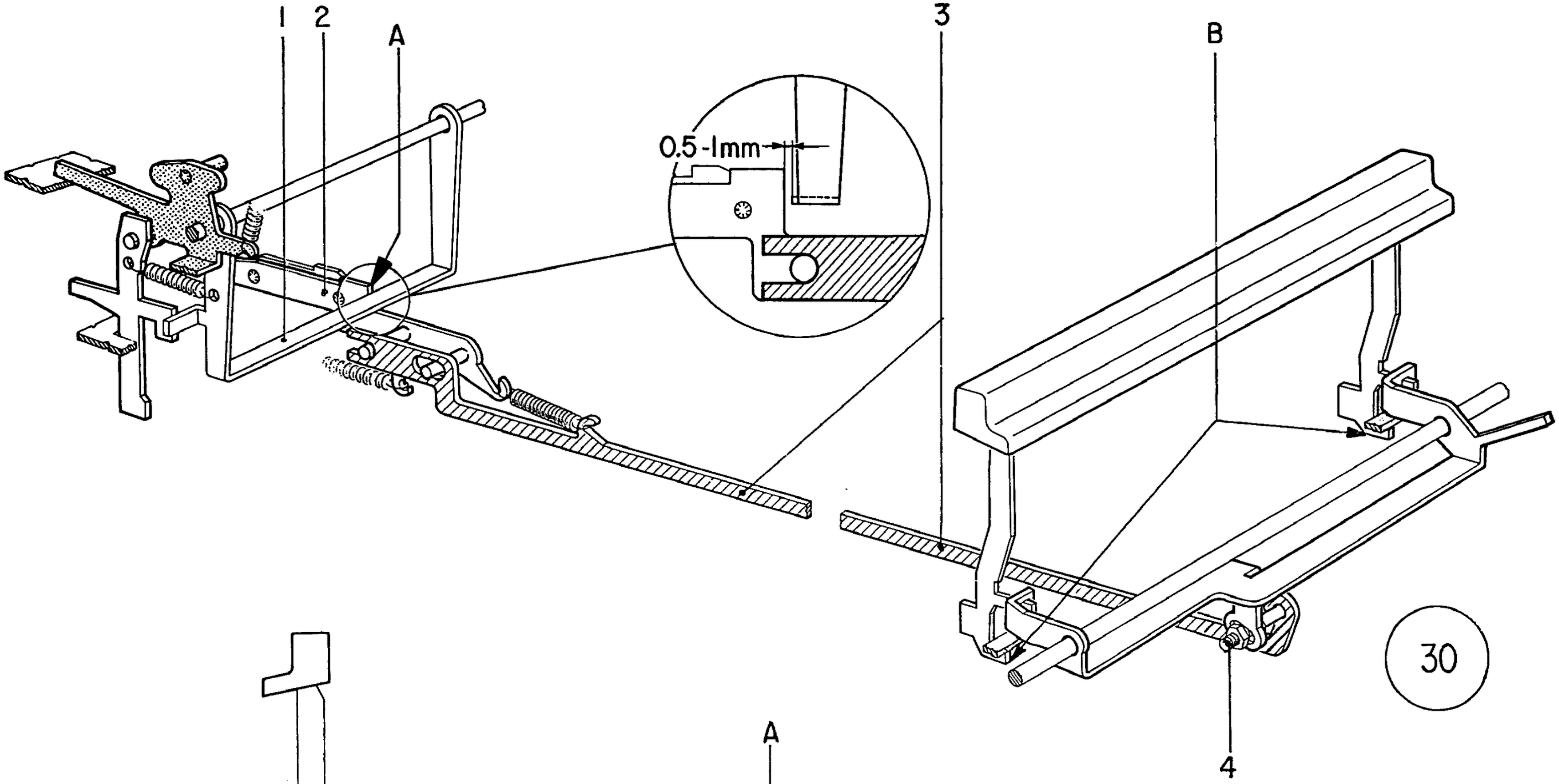
Figure 29 shows the activating link (2) for the tab clear key. The activating link for the tab set key (not shown in the figure) is similar to the tab clear activating link. At rest position the step (A) of the activating link (2) for either the tab clear or tab set must clear the beam of the universal bar (3) between 0.5 to 1 mm when the latter rotates.

To adjust for the above clearance, position the respective activating link (2) by means of the coupling (1).

TABULATOR BAR ACTIVATING LINK (REST POSITION) ADJUSTMENT

At rest position the extension (B) of both tabulator bar stems must be against the rubber stop of the keyboard frame. With the tabulator bar at rest position, the step (A) of the tabulator bar activating link extension (2) must clear the beam of the bail (1) between 0.5 to 1 mm. (Refer to figure 30 and upper detailed inset.)

To adjust for the above clearance, position the activating link (3) by means of the coupling (4).



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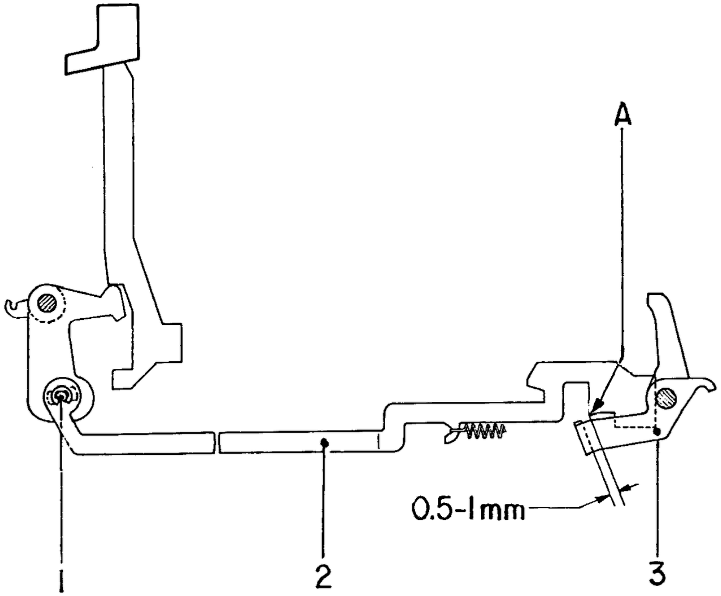


29

SERVICE CAM ACTIVATING BAIL (REST POSITION) ADJUSTMENT

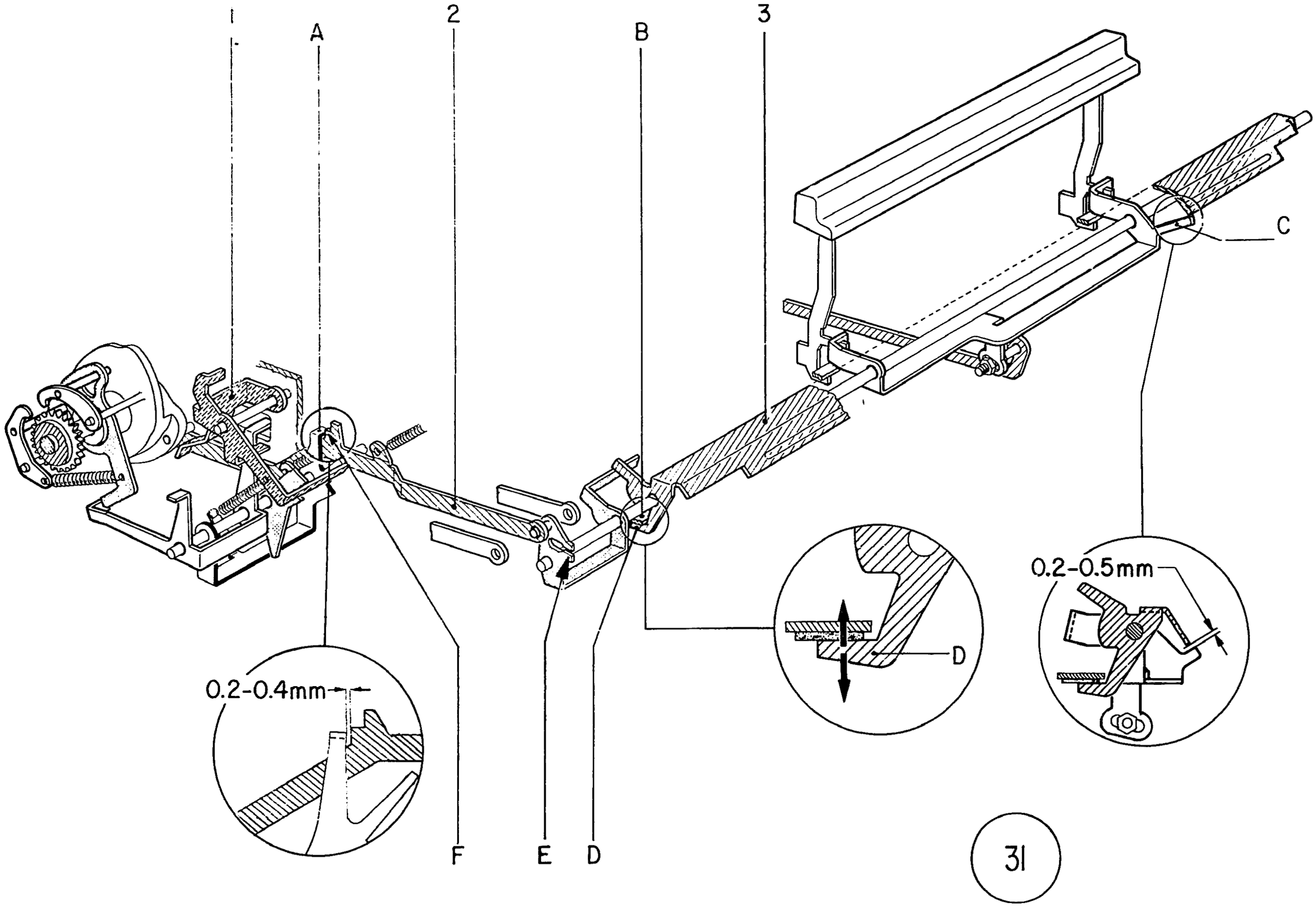
With the tabulator bar at rest, and the arm (D) of the service cam activating bail (3) resting against the rubber stop (B), there should be a clearance of 0.2 to 0.5 mm between the extension (C) and the bail (3). Refer to lower right inset.

To obtain the above clearance, form the arm (D) of the bail (3) as required. Refer to center inset.

SERVICE CAM ACTIVATING BAIL TRIP LINK ADJUSTMENT

With the tabulator bar at rest, and the arm (D) of the service cam activating bail (3) resting against the rubber stop (B), there should be a clearance of 0.2 to 0.4 mm between the step (F) of the trip link (2) and the wing (A) of the intermediate bridge. Refer to lower left inset.

To obtain the above clearance, open or close the U-shaped opening (E) in the command bridge as required.


1
A
2
B
3
C
0.2-0.5mm
D
0.2-0.4mm
F
E
D
31

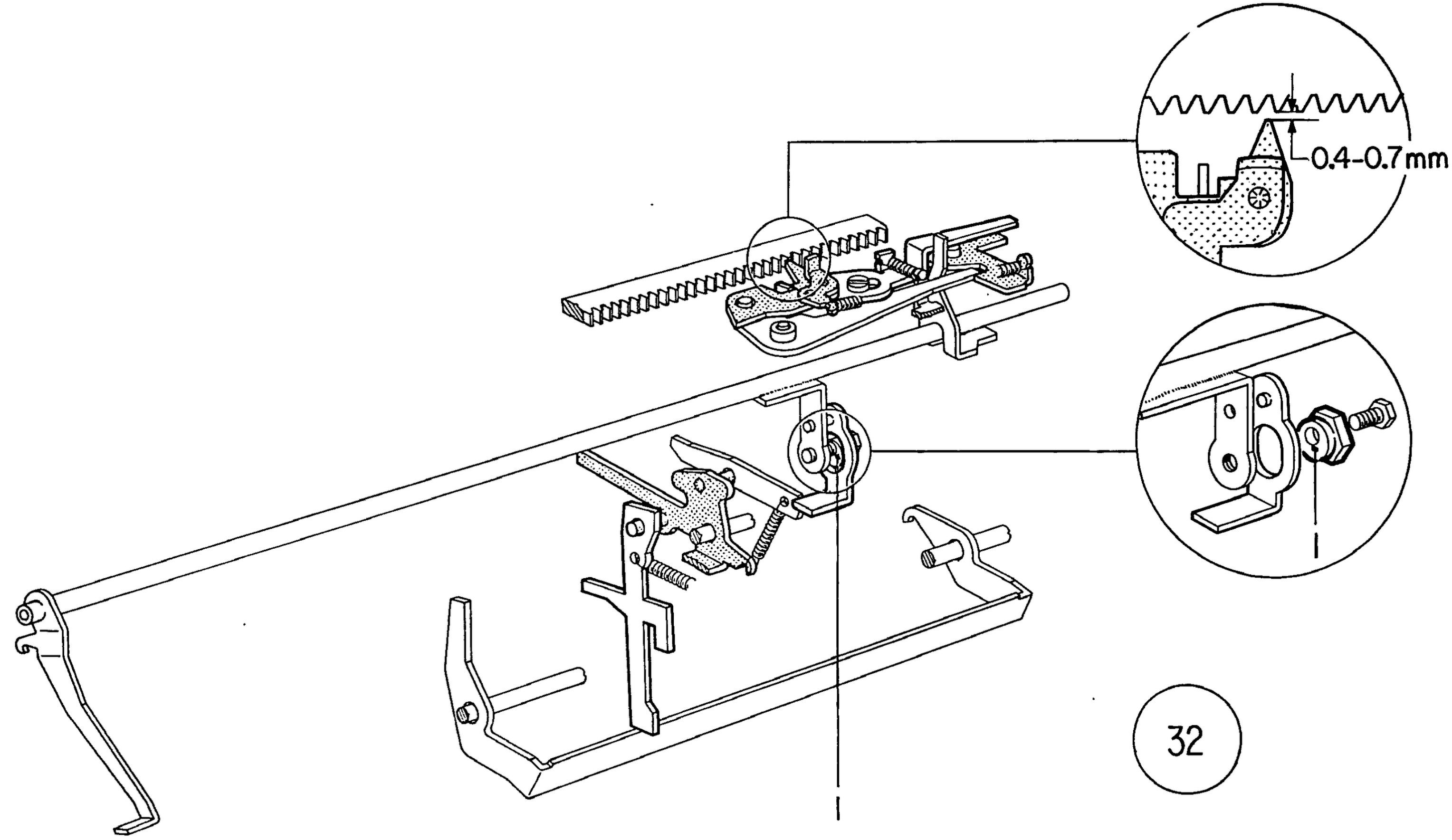
ESCAPEMENT DOG DISENGAGEMENT ADJUSTMENT

To ensure proper movement of the carriage during tabulation, the escapement dog should disengage from the rack between 0.4 to 0.7 mm as shown in the upper inset.

To observe the above clearance, proceed as follows:

- Place the machine on its back.
- The escapement dog can be seen through the access hole in the carriage fixed rail casting located directly above the "service unit."
- Hold the tabulator bar depressed, and turn the power shaft until the service cam stops at 90 degrees of rotation.
- Check that the release clearance of the escapement dog is 0.4 to 0.7 as shown in upper inset.

To obtain the 0.4 to 0.7 mm release clearance, adjust the eccentric (1) while the machine is in the condition outlined above.



32

ESCAPEMENT DOG RE-ENGAGEMENT ADJUSTMENT

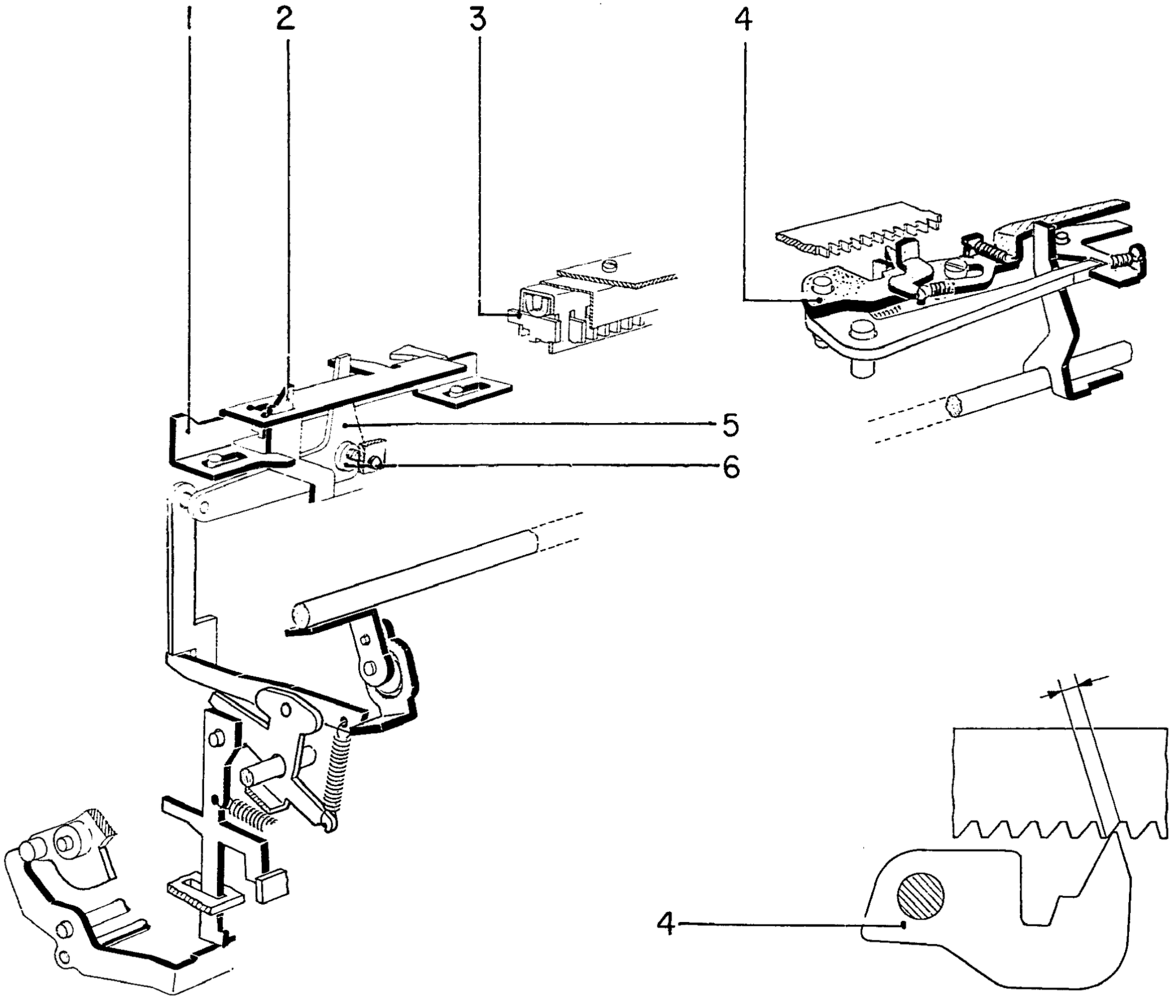
As the tabulation cycle is completed, the escapement dog must re-engage with the rack at the proper time to ensure accurate stopping of the carriage at the point in which a tab stop has been preset.

When a set tab stop (3) contacts and moves the stop blade (2) and guide plate (1) to the left, the escapement dog (4) must enter against a rack tooth in the area indicated by the parallel lines in figure 34.

To obtain the proper dog engagement to the rack, adjust the eccentric (6) of the crank (5) as required (figure 33).

> Note. When the guide plate (1) is moved to the left, it actuates the air-cylinder mechanism (not illustrated) to cushion the stopping of the carriage. The actuation of the air cylinder always occurs during tabulation, except during an "express margin operation" when the left margin stop is being positioned to a tab stop location.

33



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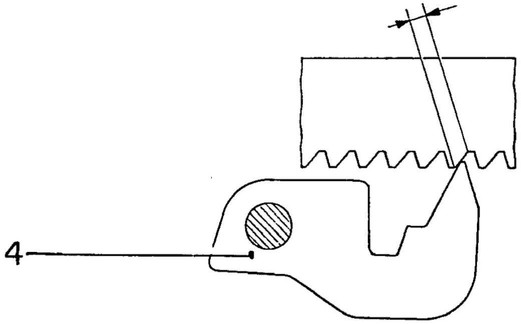


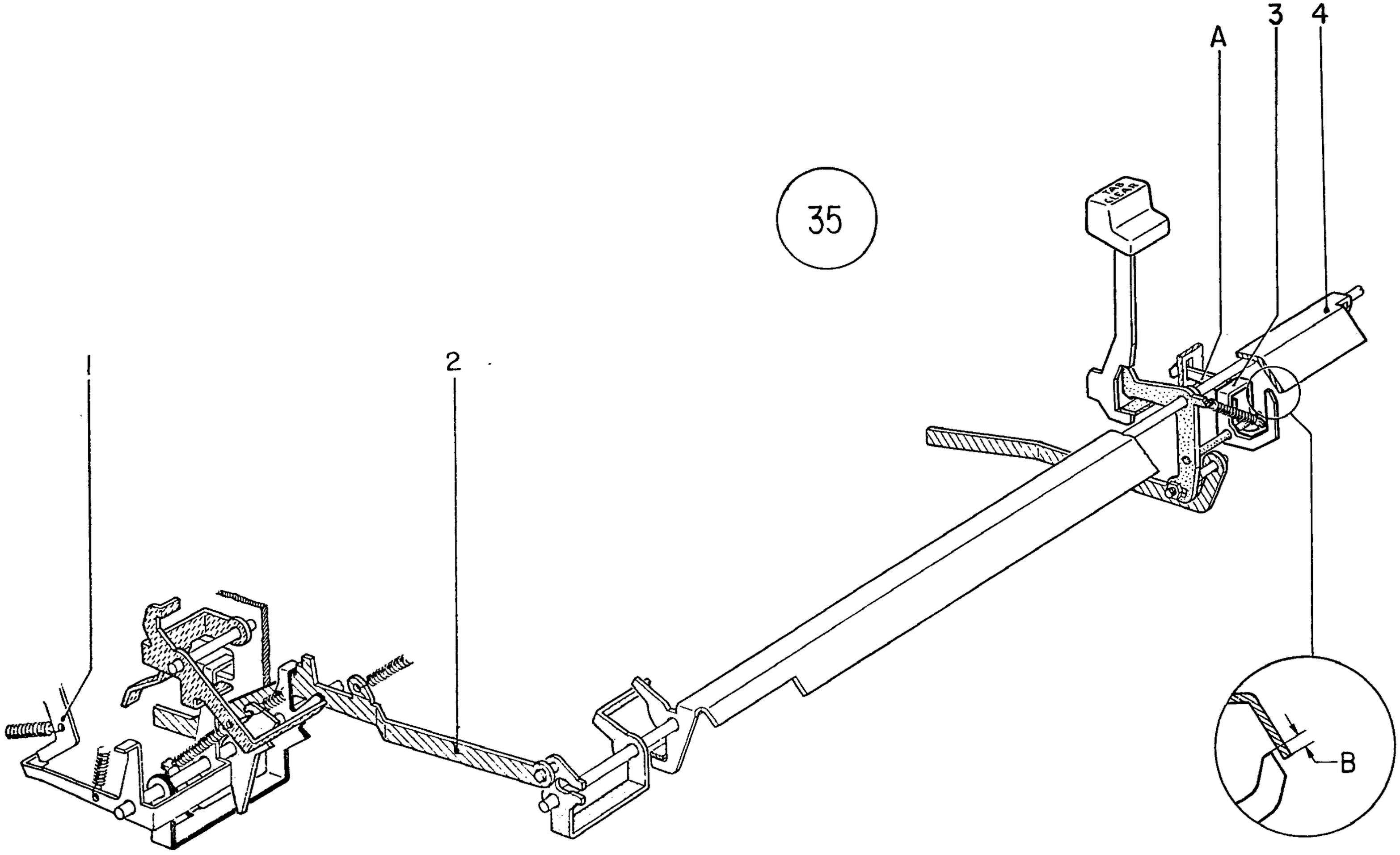
TABULATOR CLEAR KEY RELEASE LEVER ADJUSTMENT

When the tabulator clear key is depressed, the release lever (3) must trip the service cam activating bail (4), and immediately allow the bail and trip link (2) to restore. This permits another service cycle to take place, (such as tabulation) in combination with the tab clear key operation..

To check for the above condition, perform the following:

- With the machine at rest and the power cord unplugged, check that the arm (A) of the release lever (3) is resting against the bottom of the slot in the keyboard frame.
- Slowly depress the tab clear key and check that the following conditions take place in the order given:
  1. The starting lever releases the flange (1).
  2. The trip link (2) returns to rest.
  3. The tab clear key still has a slight additional downward travel remaining.

If condition 1 above fails, form the release lever (3) to increase the hold (B), as shown in lower inset. If conditions 2 or 3 fail, form the release lever (3) to decrease the hold (B).



TAB CLEAR
A
B

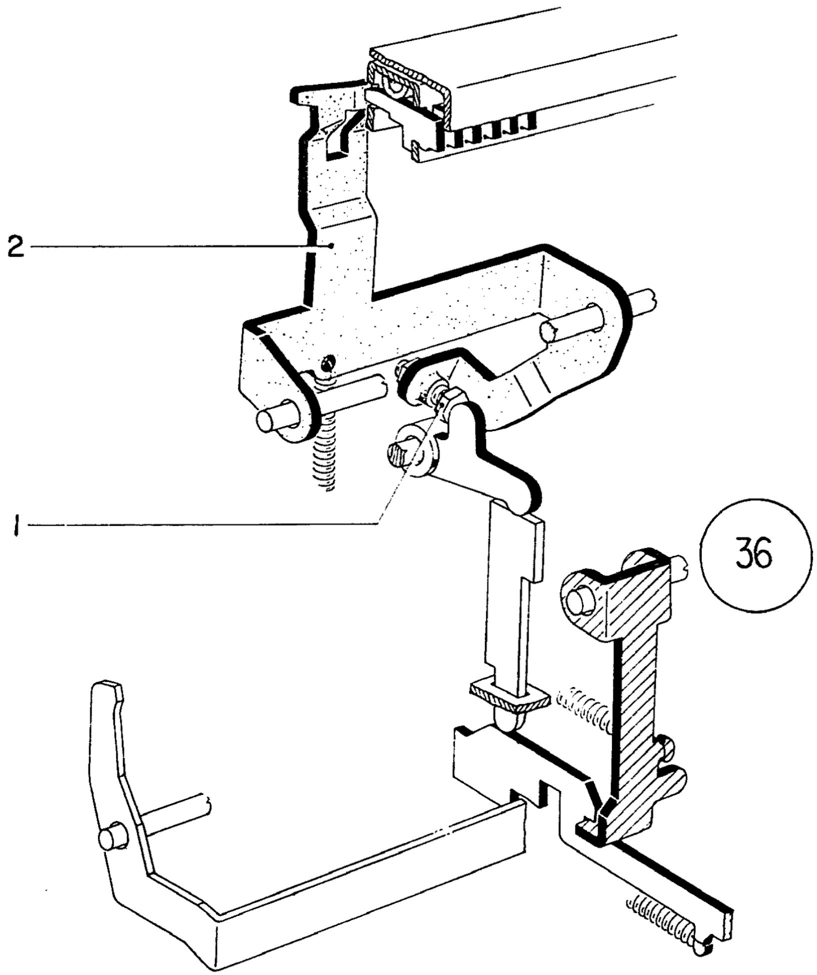
TABULATOR CLEARING FINGER (WORKING POSITION) ADJUSTMENT

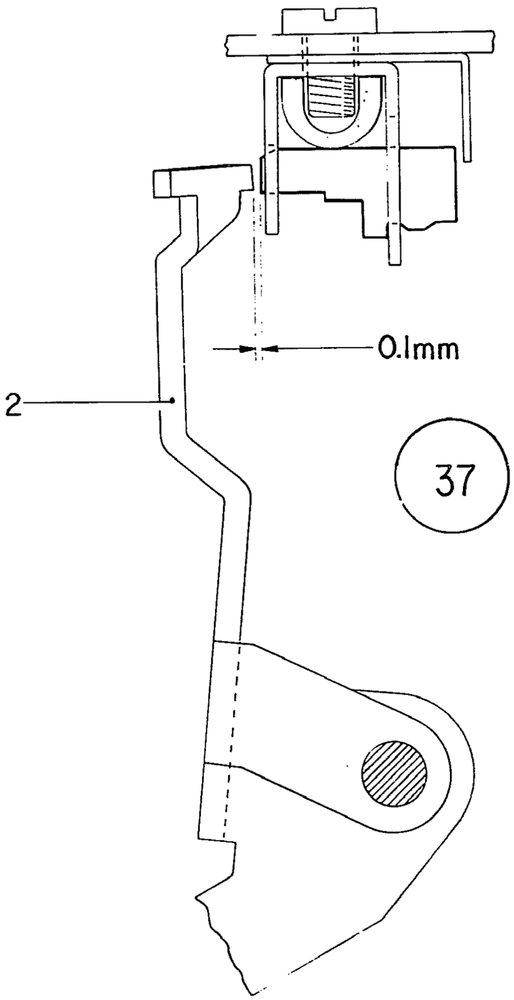
When the tabulator clearing finger is operated, it must fully restore the tab stops, but must not travel far enough to bind against the restored stops.

To check for the above condition, depress the tab clear key while manually turning the power shaft. When the clearing finger (2) rotates to its full working position, it must clear the restored stops by 0.1 mm (figure 37).

To obtain the above clearance, regulate the adjusting screw (1) of the tabulator clearing finger (2), figure 36.

> Note. The lateral position of the tab setting and clearing fingers is established by the "service plate," as described in the Banking Adjustment, page 304.




0.1mm
2
37

SECTION 25

EXPRESS MARGIN

INTRODUCTION TO EXPRESS MARGIN

The express margin feature offers a convenient and rapid method of positioning the left margin stop to predetermined locations by use of the express margin key.

The express margin key can be either fully or partially depressed.

When the express margin key is depressed partially:

- It actuates the margin setting finger.
- It causes the carriage to tabulate.

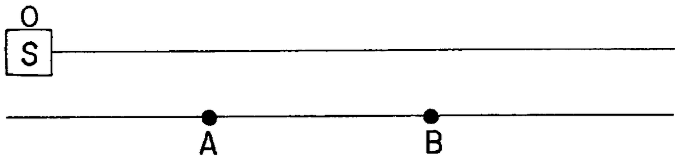
When the express margin key is fully depressed:

- It actuates the margin setting finger.
- It presets the tabulation of the carriage.
- It causes the carriage to return (without line spacing).

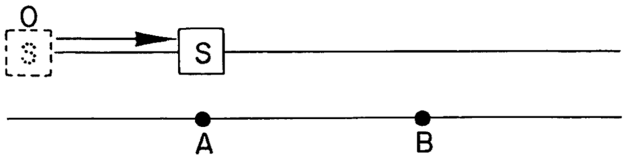
When the express margin key is released from a fully depressed position, the margin setting finger remains actuated, the carriage return stops and the carriage immediately starts to tabulate.

The following examples show various usages of the express margin feature:

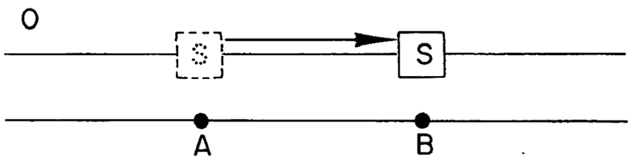
- The left margin stop (S) is at zero position.
- Two tab stops (A and B) are set.



To reposition the margin stop (S) to the tab stop position (A), simply return the carriage to the margin stop and depress the express margin key. The key should be depressed to the partial position and immediately released.

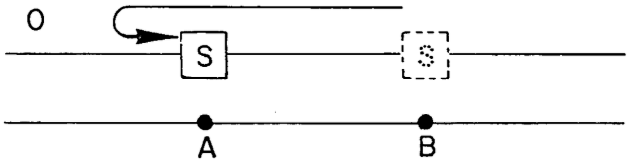


To reposition the margin stop to the (B) tab stop position, again depress the express margin key as described in the previous paragraph. The margin stop (S) will be relocated at the (B) tab stop position as shown below:



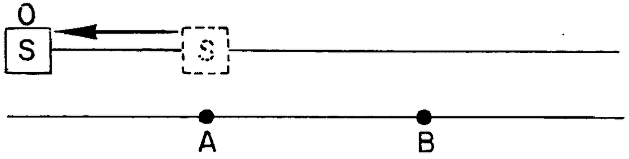
To reposition the margin stop from (B) back to (A) tab stop position:

- Return the carriage to the margin stop.
- Fully depress and hold down the express margin key.
- Release the express margin key immediately after the carriage has passed the position where the tab stop (A) is set.



To reposition the margin stop (S) from tab stop (A) back to zero position:

- Return the carriage to the margin stop.
- Fully depress and hold down the express margin key until the carriage has returned to zero position.
- Depress and quickly release either the back space key or the tabulator bar. This action will immediately terminate the tabulation cycle and allow the margin setting finger to restore.
- Release the express margin key.



When the carriage is returned by means of the express margin key, the vertical line spacing of the platen is prevented. The reason for the exclusion of line spacing is described later in this section.

Only the left margin stop can be repositioned with the express margin key. It is not possible to move the right margin with the express margin key since the carriage would have to be located at the right margin for the margin setting finger to engage the stop. Therefore, with the carriage at the right margin (end of writing line), a tabulation cycle can start, but it is immediately terminated through the tabulator release mechanism.

EXPRESS MARGIN MECHANISM (REST POSITION)

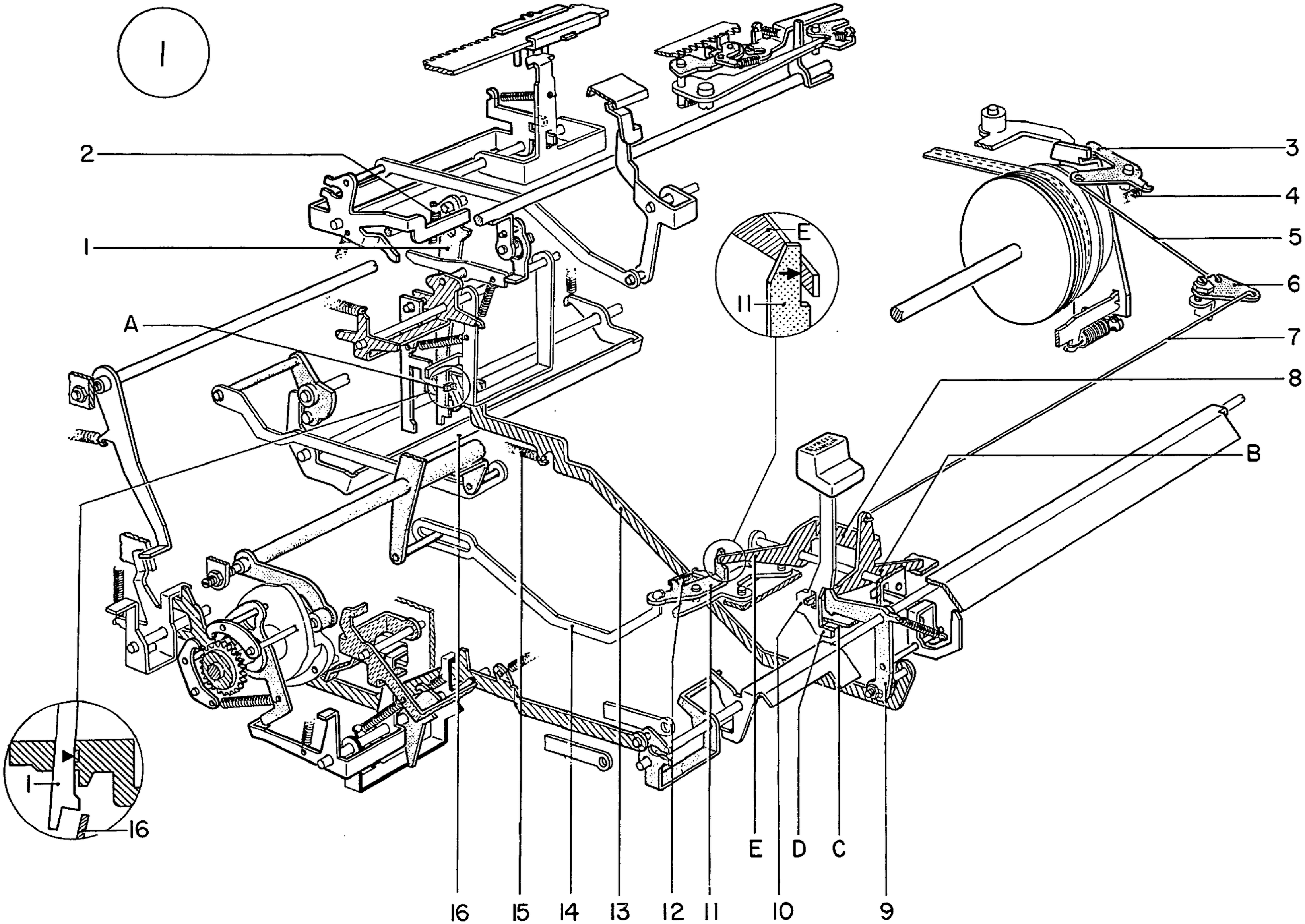
Figure 1 shows the rest position of the parts specifically related to the express margin mechanism.

The extension (D) of the express margin key stem (10) rests against the rubber pad (C) of the keyboard frame, through the action of the crank (9), link (13) and spring (15).

The rest position of the bell crank (3) is established by the arm (B) of the bridge (8) resting against the keyboard frame, through the action of the links (5 and 7), crank (6) and spring (4).

The rest position of the stop lever control link (14) is established by the stop lever (11) resting against the arm (E) of the bridge (8), through the action of the spring (12). (Refer to upper inset.)

The wing (A) of the activating link (13), together with the spring (2), establishes the rest position of the express margin set plunger (1). In this position, the bottom step of the plunger (1) is out of the path of the universal bar (16). (Refer to lower inset.)


A
B
E
E
D
C

EXPRESS MARGIN ACTIVATION (PARTIAL KEY DEPRESSION)

When the express margin key is partially depressed and immediately released, the following occurs:

- The presetting of the margin stop setting and tabulation mechanisms by placing the plungers (3 and 4) in the path of the universal bar (2).
- The engagement of the service cam clutch.

When the express margin key is depressed, its downward travel is stopped at the partial position by the arm (B) of the bridge limiting against the step (C) of the stop lever (12). (Refer to right-hand inset.)

The partial downward travel of the express margin key causes:

- The activating link (9) to move forward, through the rotation of the crank (10), placing the two plungers (3 and 4) in the path of the universal bar (2). (Refer to center left inset.)
- The crank (10) to rotate the release lever (8) which, in turn, rotates the service cam activating bail (11), causing the service cam to engage. (Refer to lower left inset.)

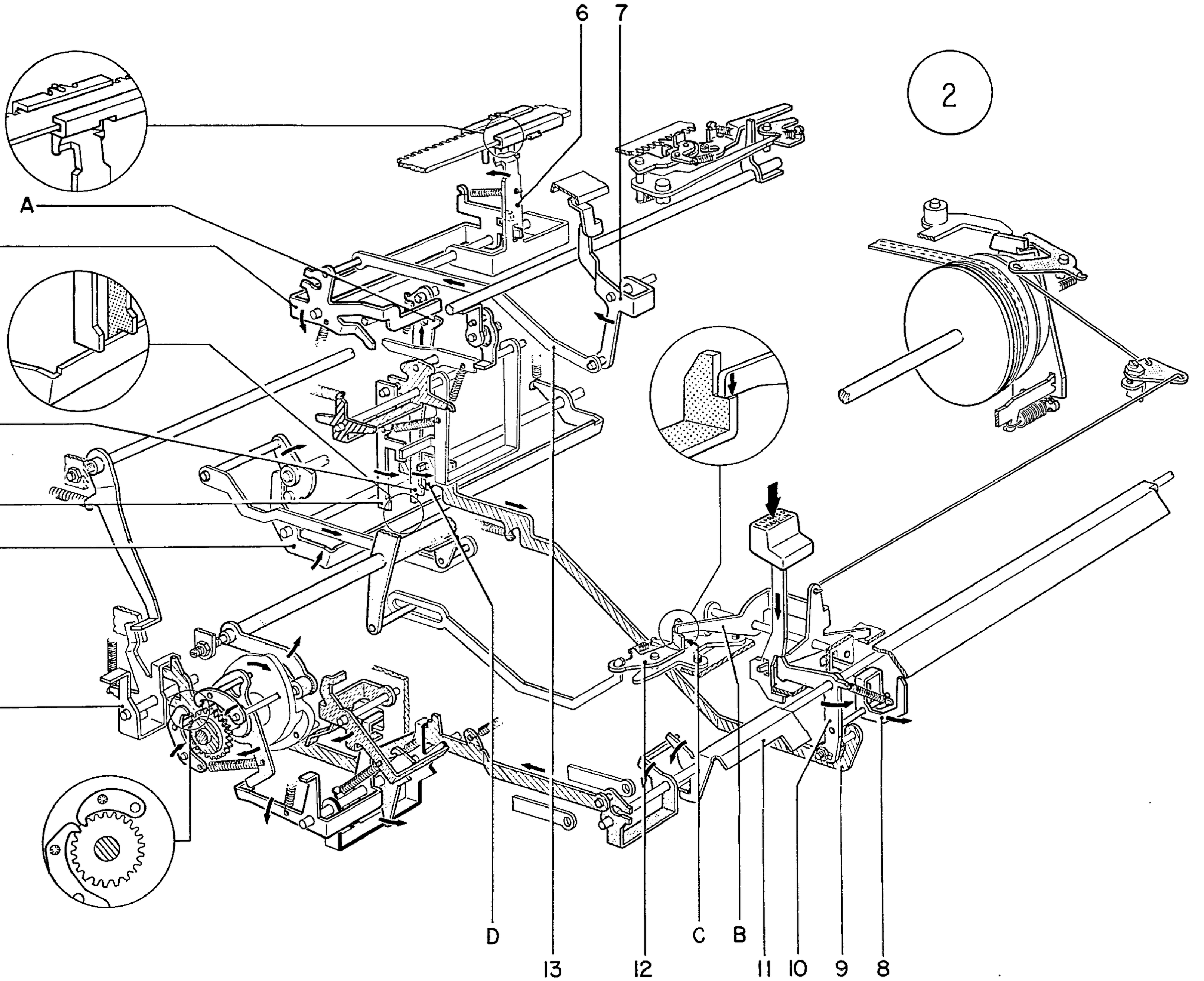
As the service cam starts to rotate, the universal bar (2) raises both plungers (3 and 4), actuating the tabulation and margin stop setting mechanisms.

- The actuation of tabulation occurs in the usual manner.
- The actuation of the margin setting finger (6) occurs through the upward movement of the plunger (4). The step (A) of the plunger contacts the wing of the bridge (5), causing the bridge to rotate and, in turn, causes the margin setting finger (6) to engage with the left margin stop. (Refer to upper left inset.)

The rotation of the bridge (5) also causes the link (13) to rotate the line space exclusion bridge (7). Further description of this mechanism is covered later in this section.

The left margin stop is now under the control of the margin setting finger (6), and the cycle of the service cam has stopped at 90 degrees through the action of the stop lever (1). The carriage will tabulate to the nearest set tab stop, and the service cam will then complete its cycle. All parts involved in the mechanism will return to rest.

The express margin cycle will be stopped at the completion of the cycle, even though the express margin key is held at the partially depressed position. It is not recommended to hold the express margin key down during this particular kind of cycle, because actuation of the carriage return mechanism may take place; therefore, the express margin key should be depressed and quickly released. However, it is possible that the activating link (9) could restore as the upward travel of the universal bar (2) occurs, causing the required functions to fail to operate. To prevent this possibility, the step (D) of the activating link (9) is held by the universal bar, and retains the activating link in the forward position. This ensures that the tabulation and margin setting plungers (3 and 4) are held in their working position when the express margin key is released.


②
A
D
C
B

EXPRESS MARGIN ACTIVATION (FULL DEPRESSION)

When attempting to depress the express margin key to the fully depressed position, the key will momentarily stop at the partial position first.

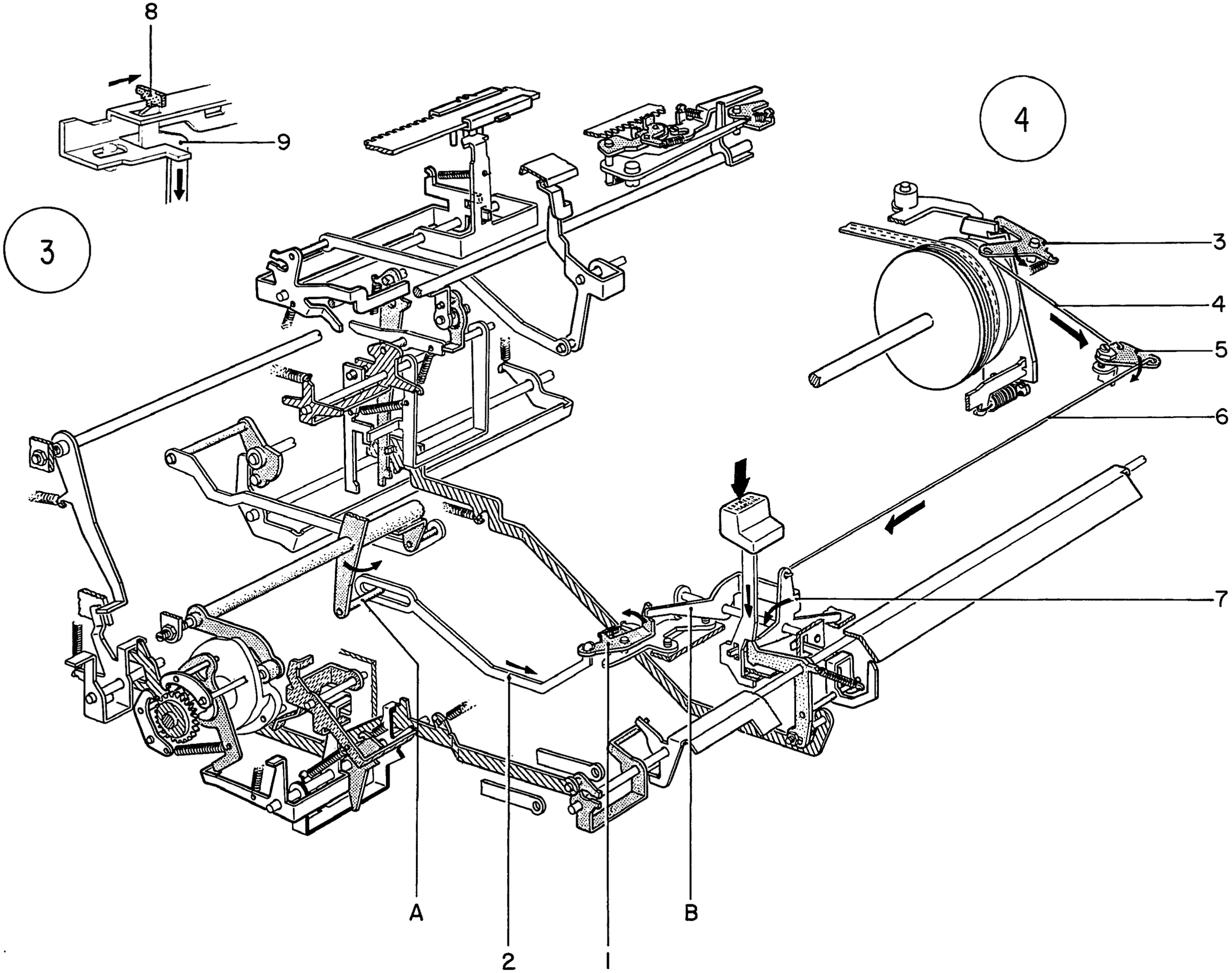
This action, as previously described:

- Presets tabulation and margin stop setting.
- Actuates a service cycle.

Before the service cycle reaches 90 degrees of rotation, the stud (A) of the reset operating shaft drives the stop lever control link (2) forward. This movement rotates the stop lever (1), causing it to release its hold on the arm (B) of the bridge (7). The pressure which is manually exerted on the express margin key causes the bridge (7) to rotate farther, allowing the key to be fully depressed.

The full depression of the express margin key manually engages the carriage return friction clutch, through the parts (7, 6, 5, 4 and 3). The carriage, therefore, starts to return and overrides tabulation until the express margin key is released. The carriage will then tabulate to the nearest set tab stop.

> Note. When the carriage is returning, the tabulator stop blade will be in the up position, and in the path of set tab stops. Figure 3 shows that as the tab stop(s) (8) contacts the inclined surface on the left side of the tabulator stop blade (9), the stop blade is cammed down, allowing each set tab stop to by-pass it.


A
B

EXPRESS MARGIN TERMINATION (ZERO POSITION)

When the express margin key is held fully depressed, the carriage can be returned to zero position on the carriage position scale. When the carriage reaches zero position, the tabulator bar or back space key must be depressed and quickly released, to terminate the express margin (tabulation) cycle. This results in both the carriage and the left margin stop being located at zero position.

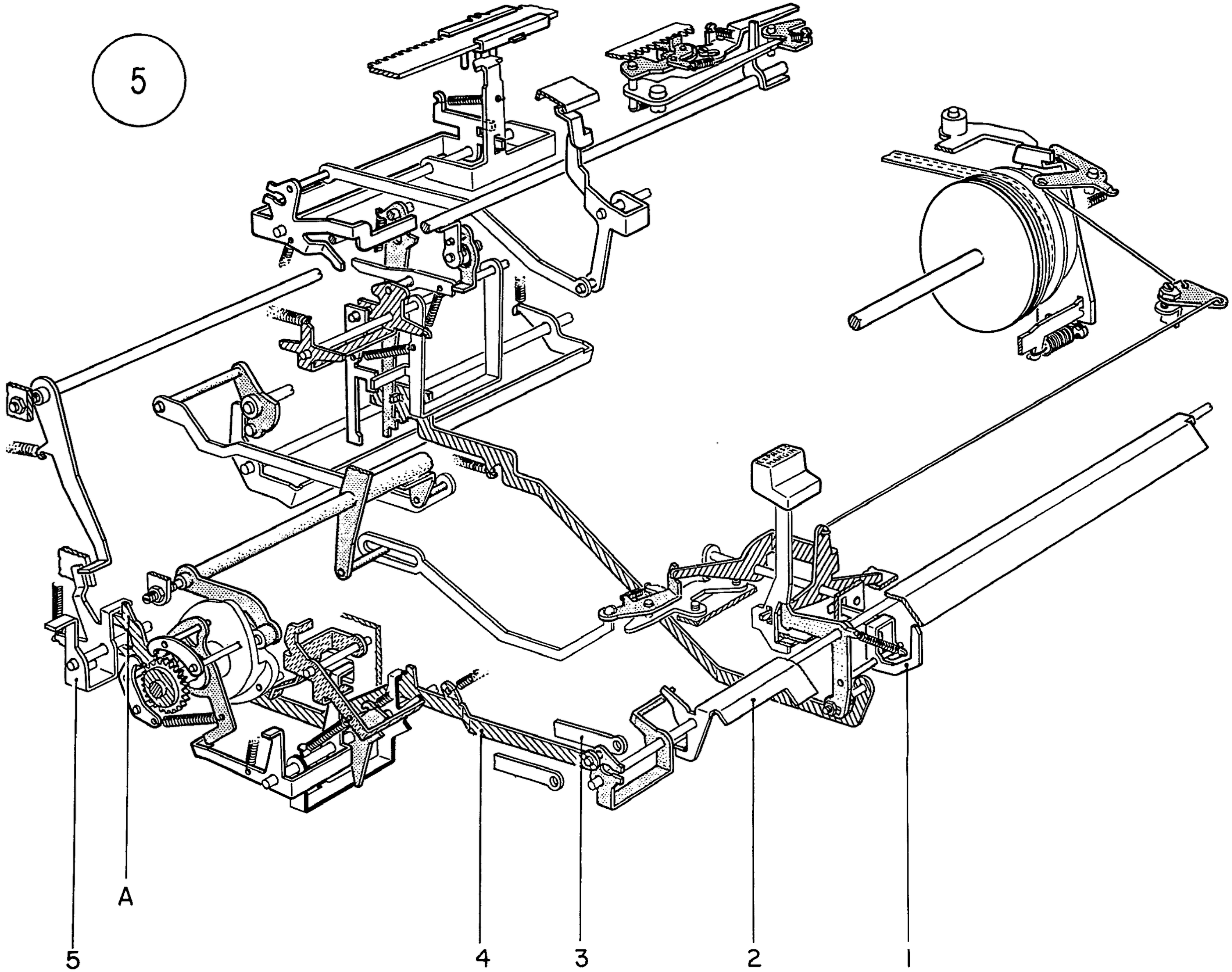
When the carriage was brought to zero position via the express margin key, the service cam was still held at the 90-degree position by the stop lever (5). The tabulator mechanism was still in the active position, but the trip link (4) returned to rest through the tripping action of the release lever (1) on the bail (2).

Depression of the tabulator bar terminates the express margin cycle through the action of the trip link (4) moving rearward, and its step (A) rotating the stop lever (5). The service cam completes the cycle, and all parts involved return to rest position.

The back space key will also terminate the express margin cycle in the same manner as the tabulator bar, however, the trip link (3) will rotate the stop lever (5) rather than the trip link (4).

In either case, if the tabulator bar or back space key is not released quickly, the service cam will be free to start another cycle.

⑤



LINE SPACE EXCLUSION

When the carriage return is controlled by the express margin key, the vertical line spacing of the platen is prevented. It is desirable that line spacing be excluded during an express margin operation, since line spacing took place during the initial carriage return, prior to the depression of the express margin key.

Line spacing is excluded during the carriage return operation by preventing the line space pawl (1) from engaging the teeth of the ratchet (8).

Assembly (Rest Position).

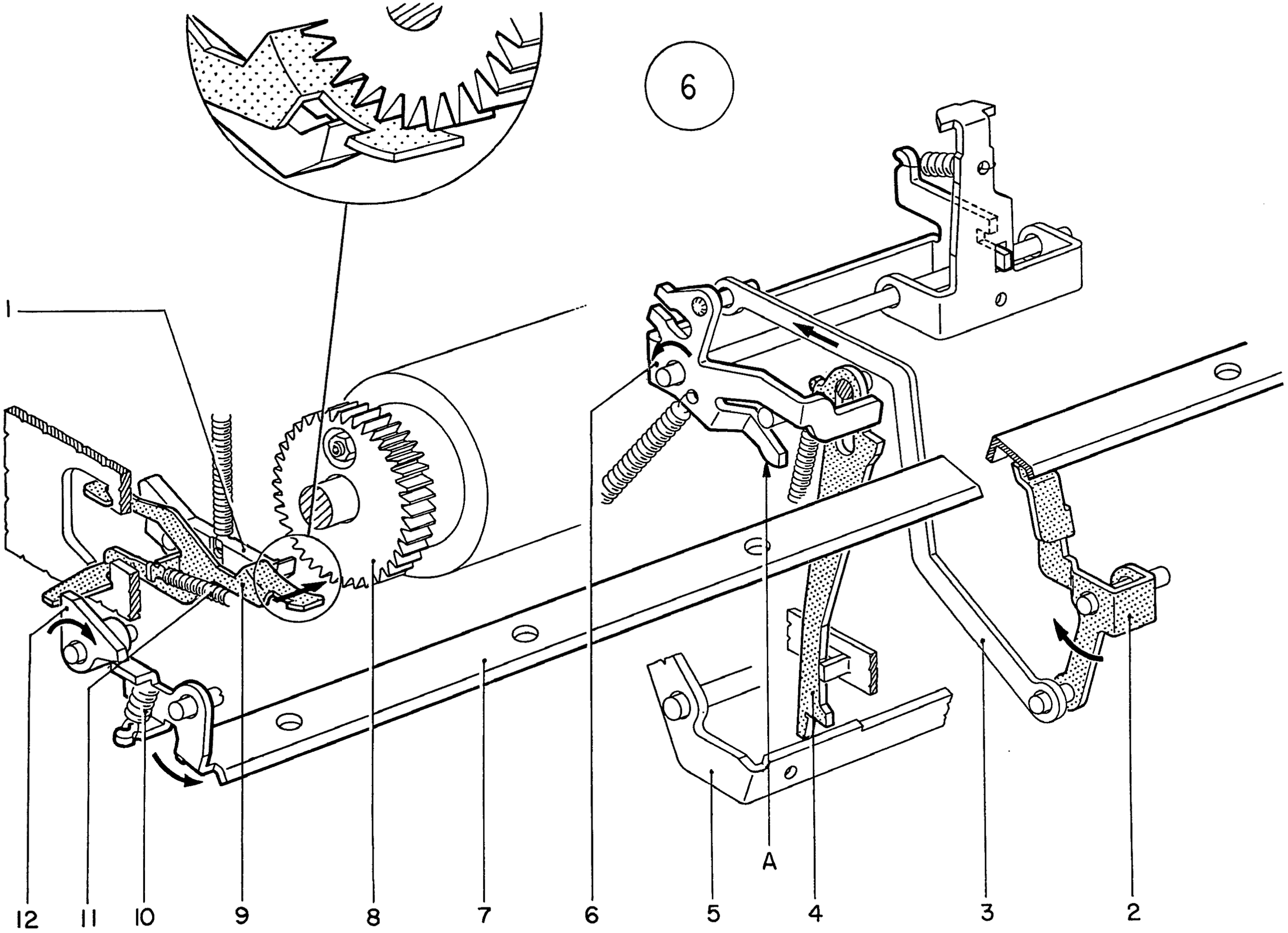
Figure 6 shows the margin setting finger control bridge (6) connected to the line space exclusion lever (2) by the link (3). The carriage release bail (7) is positioned over the lever (2) and, through the tension of spring (10), the crank (12) keeps the line space exclusion slide (9) to the left of the ratchet (8).

Activation.

During an express margin operation, the universal bar (5) raises the plunger (4), and rotates the margin setting finger control bridge (6) in the direction of the arrow. This action causes the link (3) to actuate the parts (2, 7, and 12), allowing the slide (9) to position under the ratchet (8) through the tension of the spring (11). (Refer to upper inset.) With the line space exclusion slide (9) in the active position, the line space pawl (1) is unable to engage the ratchet (8), and its forward movement will not space the platen.

During a margin setting operation, the margin setting control bridge (6) is rotated by a plunger acting on arm (A). Consequently, the carriage release bail (7) is rotated in the same manner as during an express margin operation.

In either of the above cases, the rotation of the bail (7) must be limited to only engage the slide (9) under the ratchet (8), without disengaging the escapement dog from the rack.


A

ADJUSTMENTS

Before performing the adjustments of the express margin mechanism, the following four adjustments should be verified for correct operation:

1. BACK SPACE BLOCK-OUT ARM CLEARANCE ADJUSTMENT

   This adjustment is covered in Section 19 (Half-Space), page 214.

2. BACK SPACE BLOCK-OUT ARM (REST POSITION) ADJUSTMENT

   This adjustment is covered in Section 18 (Backspace), page 196.

3. SERVICE CAM ACTIVATING BAIL (REST POSITION) ADJUSTMENT

   This adjustment is covered in Section 24 (Tabulation), page 354.

4. SERVICE CAM ACTIVATING BAIL TRIP LINK ADJUSTMENT

   This adjustment is covered in Section 24 (Tabulation), page 354.

EXPRESS MARGIN KEY RELEASE LEVER ADJUSTMENT

When the express margin key is depressed to the partial position, the starting lever must have released the flange (1). When the express margin key is fully depressed, the trip link (2) must have returned to rest position.

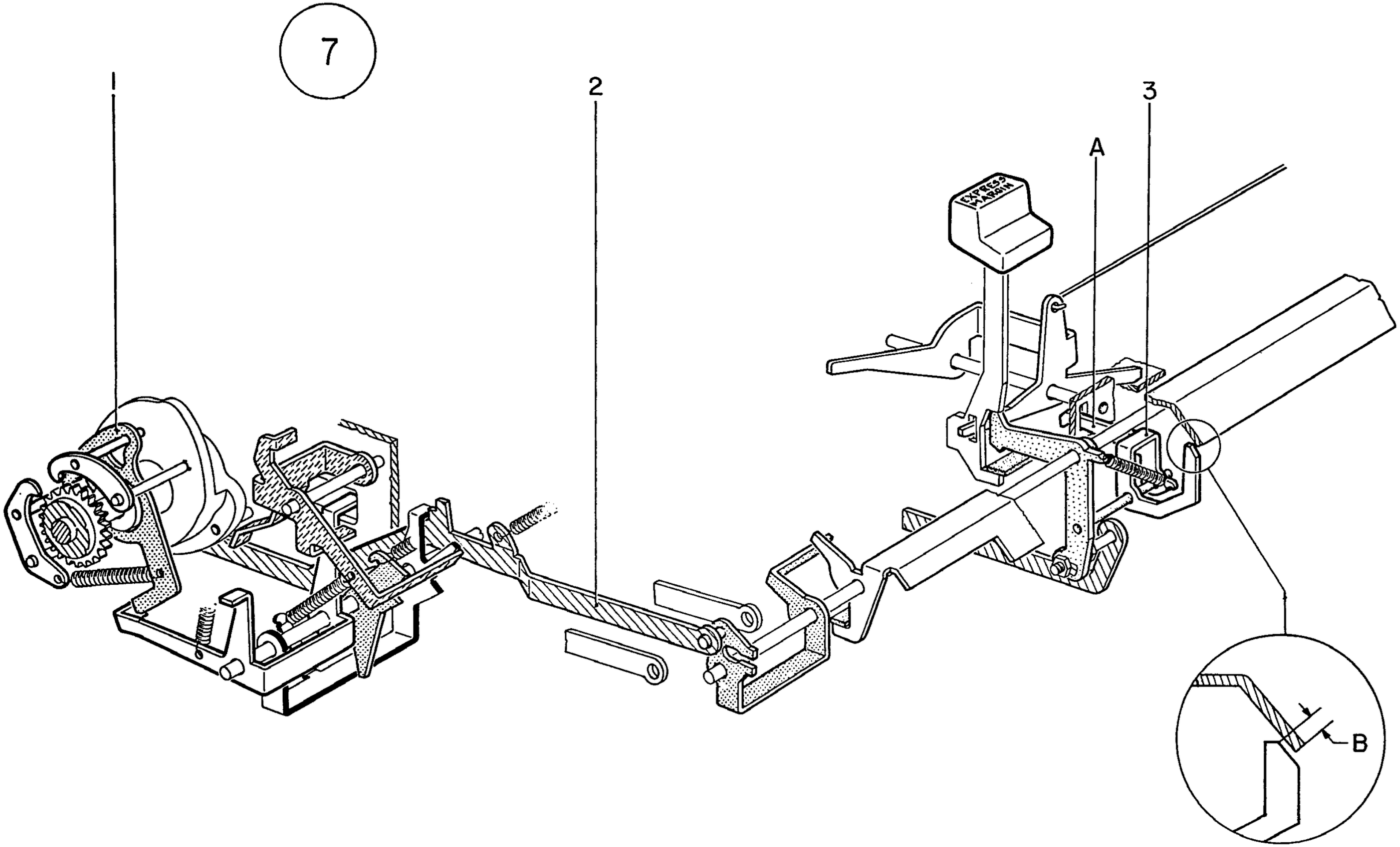
Check for the above conditions as follows:

- With the machine at rest and the power cord unplugged, check that the arm (A) of the release lever (3) is resting against the bottom of the slot in the keyboard frame.
- Press the express margin key and observe that the following takes place:
  1. The starting lever releases the flange (1) when the key reaches the partial position.
  2. The trip link (2) returns to rest during the full depression of the express margin key.

     Note. The power shaft must be rotated to allow the full depression of the express margin key.
  3. The express margin key has additional downward travel after the trip link (2) restores.

If condition 1 fails, form the release lever (3) to increase the hold (B), as shown in the lower inset.

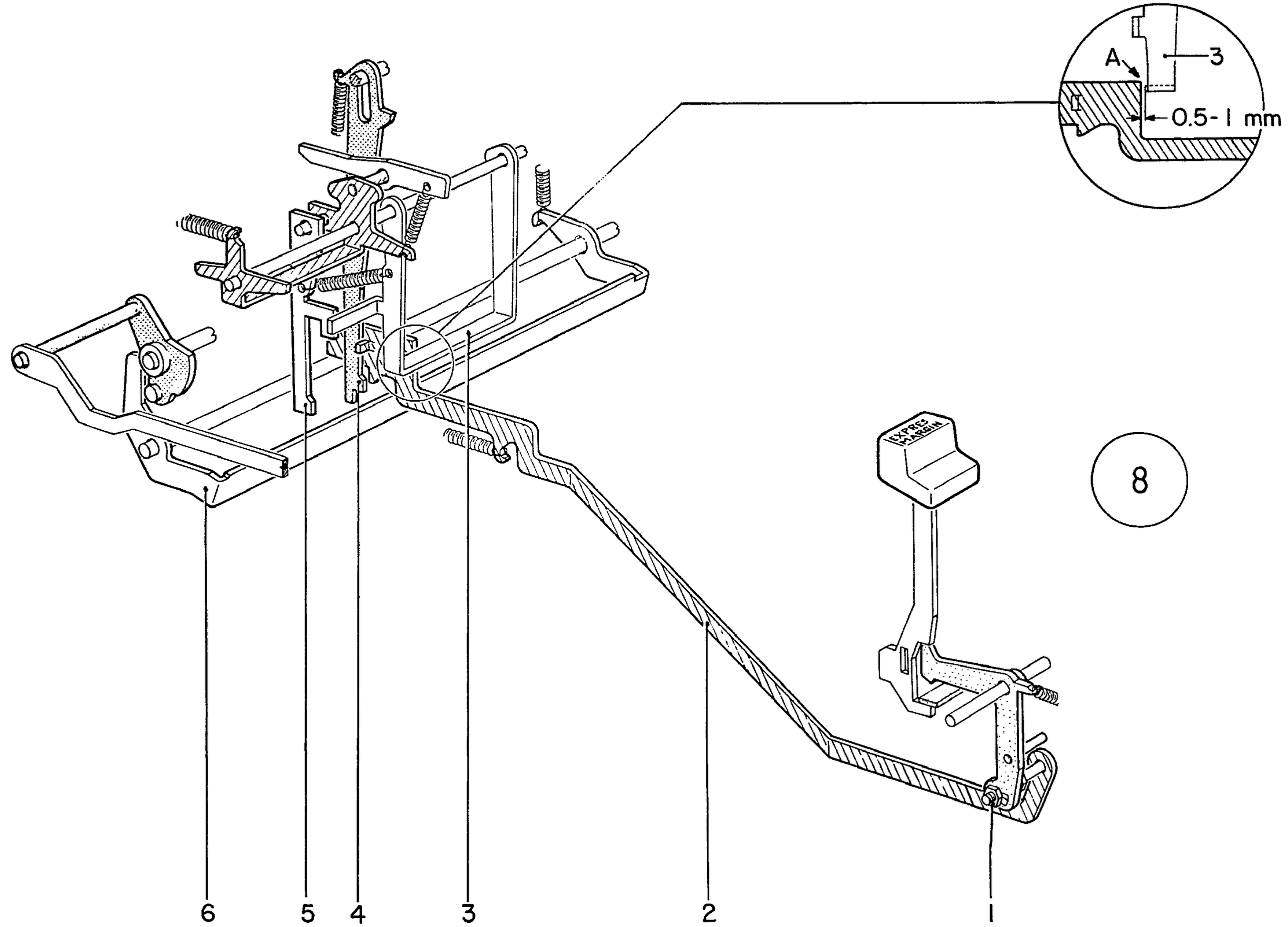
If conditions 2 or 3 fail, form the release lever (3) to decrease the hold (B).


7
1
2
3
A
EXPRESS MARGIN
B

EXPRESS MARGIN ACTIVATING LINK ADJUSTMENT

When the express margin key is depressed, the activating link (2) must allow the two plungers (4 and 5) to position over the universal bar (6) before the service cam clutch is engaged. At rest position, the plungers (4 and 5) must be held clear of the universal bar.

To obtain the above conditions, place the machine at rest position, and adjust the coupling (1) to obtain a clearance of 0.5 to 1 mm between the step (A) of the activating link (2) and the bail (3). (Refer to upper inset.)


A
0.5- 1 mm
EXPRES MARGIN

EXPRESS MARGIN KEY (FULL DEPRESSION) ADJUSTMENT

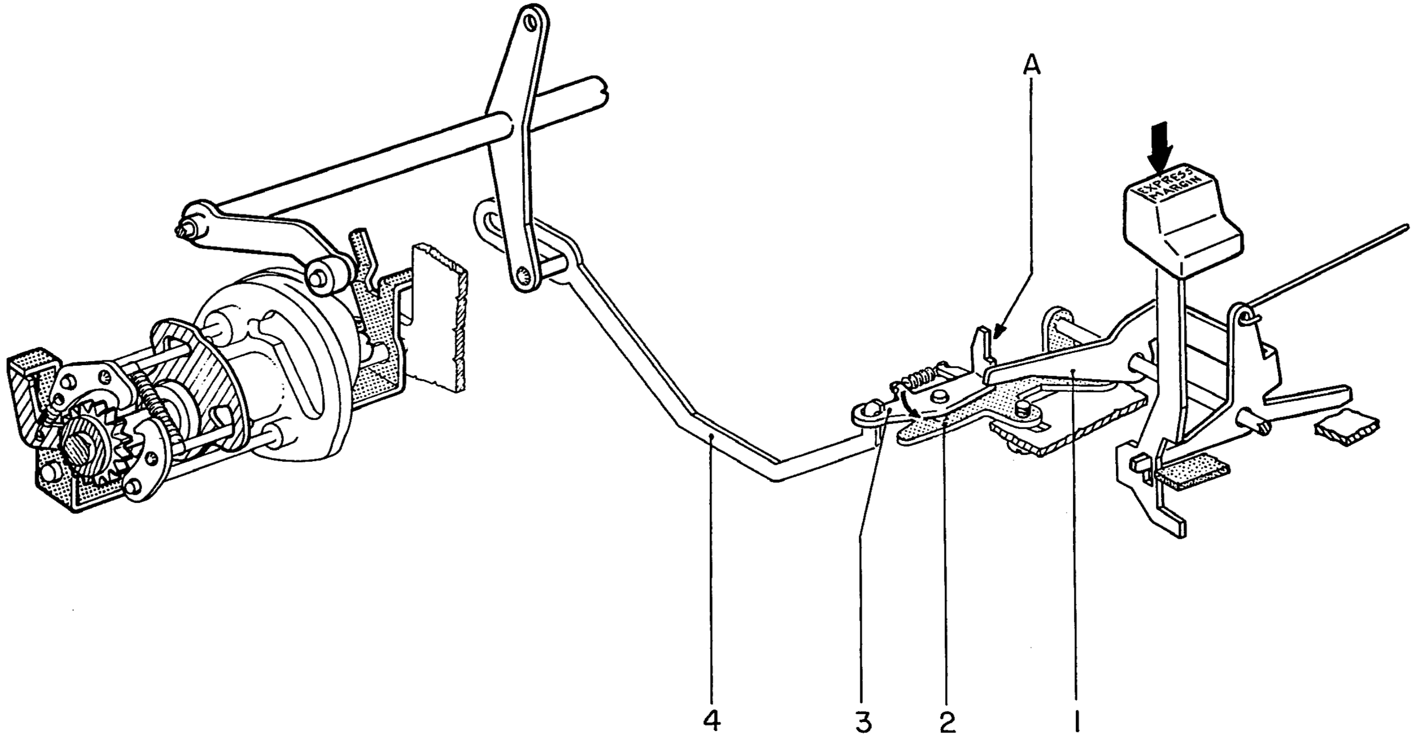
The express margin key can be fully depressed only after the service cam has rotated about 90 degrees of the cycle, as shown in figure 9.

Perform the following check to verify the proper release of the express margin key:

- With the machine at rest, and the power cord unplugged, depress the express margin key and hold it down.
- Slowly rotate the power shaft. As the link (4) moves forward, the step (A) of the stop lever (3) will release the bridge (1), and the express margin key can be fully depressed. At this time the link (4) must continue to move forward 0.3 to 1 mm before the service cam stops at 90 degrees of the cycle.

To obtain the above condition, move the support bracket (2) back or forth as required.

⑨

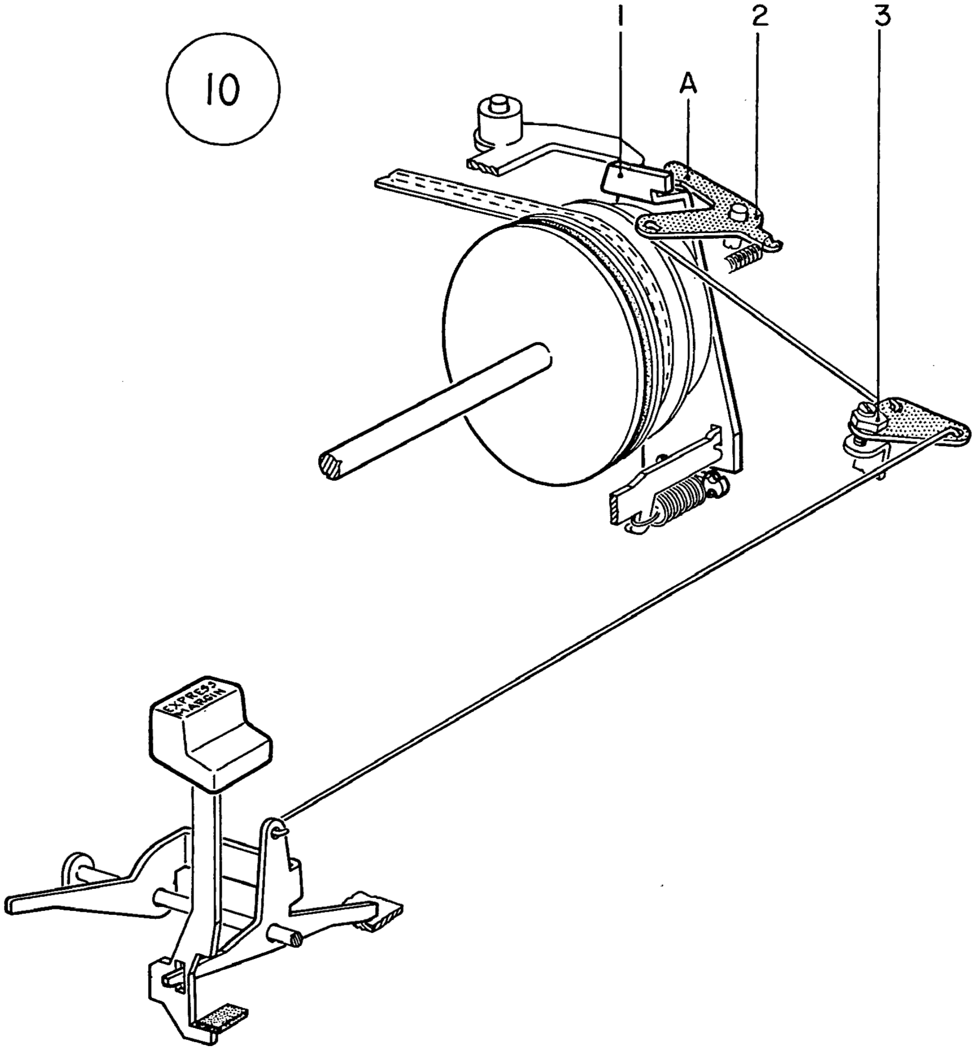


CARRIAGE RETURN FRICTION-CLUTCH ACTIVATION (BY EXPRESS MARGIN KEY) ADJUSTMENT

This adjustment ensures that partial depression of the express margin key will not engage the carriage return friction clutch, and that full depression of the key will engage the friction clutch.

Check and adjust as follows:

- With the express margin key at rest, check that the arm (A) of the bell crank (2) just contacts the pressure plate (1).
- Fully depress the express margin key and check that the clutch engages with sufficient pressure to return the carriage with a positive action.
- To adjust, regulate the eccentric (3) as required.


A
EXPRESS MARGIN

LINE SPACE EXCLUSION ADJUSTMENT

At rest position, a small clearance (B) should exist between the lever (6) and the bail (4), as shown in the inset drawing of figure 11. This will ensure that the line space exclusion slide (2) will not interfere with the engagement of the line space pawl (1) in the ratchet (3).

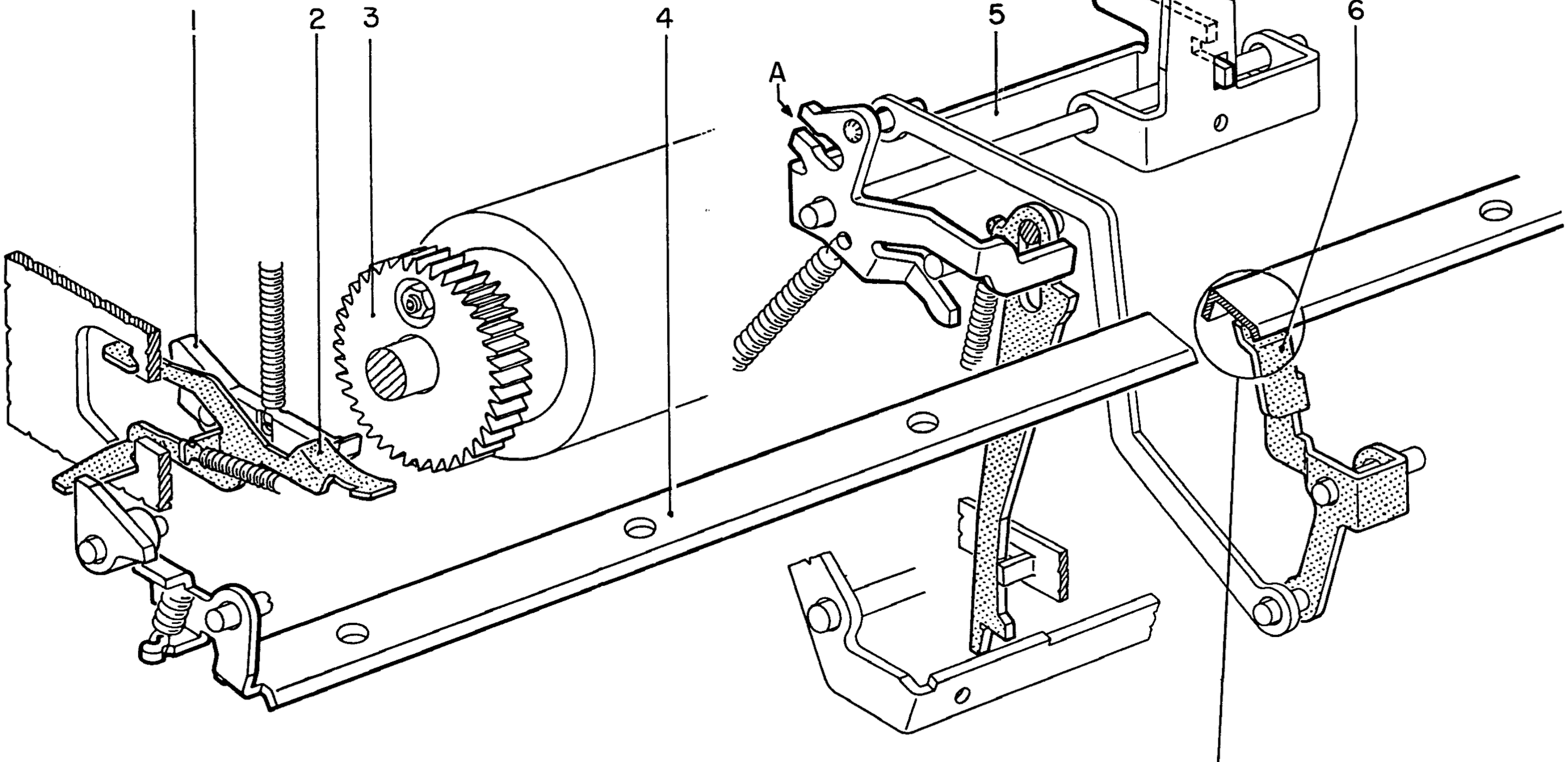
During an express margin operation, the line space exclusion slide (2) must position under the ratchet (3), preventing the pawl (1) from engaging the ratchet (figure 12).

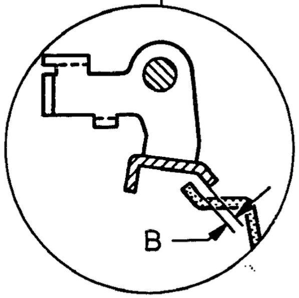
The above requirements are obtained by opening or closing the U-shaped slot (A) of the bridge (5).

BACKSPACE BLOCK-OUT ARM CONTROL LEVER RESTORE ADJUSTMENT

This adjustment ensures the stopping of the service cam at the end of the cycle. The adjustment is covered in Section 21 (Margins and Associated Mechanisms), page 266.

11





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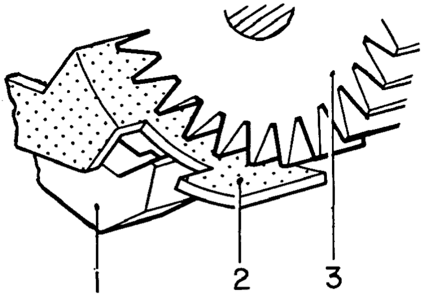


SECTION **26**

PLATEN VARIABLE
AND
PAGE-END INDICATOR

PLATEN VARIABLE

The variable is a clutch device which allows the operator to rotate the platen independently of the line space ratchet.

To release the platen from the control of the line space ratchet, the variable line spacer button (2) must be pressed. Use of the variable line spacer button enables the operator to choose a new starting point for line spacing.

ASSEMBLY

The variable is comprised of the following groups:

- Platen connecting group, consisting of the following:
  - Tubular shaft (5)
  - Platen bushing (12)
  - Left platen knob (3)
- Line space ratchet connecting group, consisting of the following:
  - Clutch shoes (7)
  - Operating levers (10)
  - Cone (9)
- Variable operating group, consisting of the following:
  - Variable line spacer button (2)
  - Plunger shaft (1)
  - Compression spring (4)

The pin (8) couples the plunger shaft (1) to the cone (9).

REST POSITION

When the variable is at rest, the line space ratchet (6) rotates with the platen. In this position, the spring (4) forces the shaft (1) and cone (9) to the left, exerting pressure against operating levers (10). This causes the clutch shoes (7) to press against the platen drum (figure 3).

ACTIVATION

When the variable line spacer button is pressed, it moves the cone (9) to the right, releasing the operating levers (10). This, in turn, relieves the pressure of the clutch shoes (7) on the platen drum (figure 4). The platen is then free to rotate independently of the line space ratchet (6) as long as the variable line spacer button is held in.

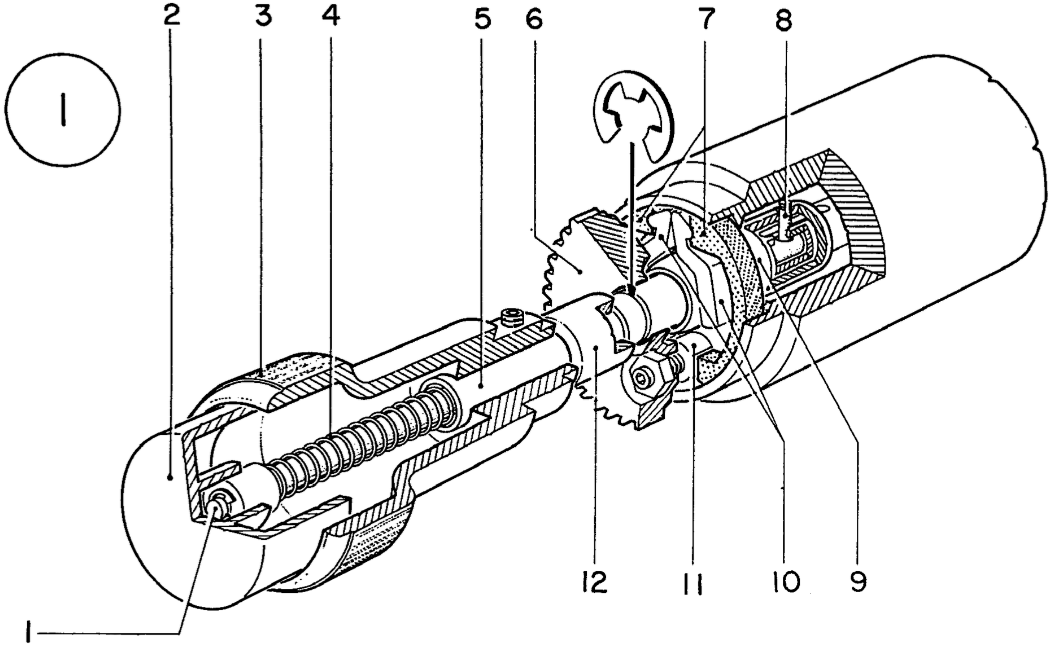
ADJUSTMENT

The variable must allow a positive connection between the platen and line space ratchet when the variable line spacer button is at rest.

With the variable line spacer button pressed, the platen must be completely free of the line space ratchet.

To adjust, reposition the adjuster (11) as required.

1



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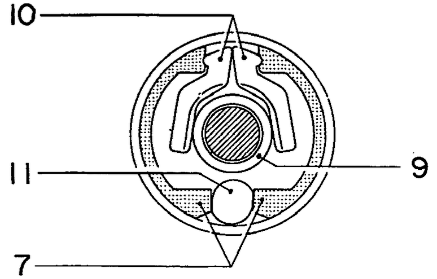

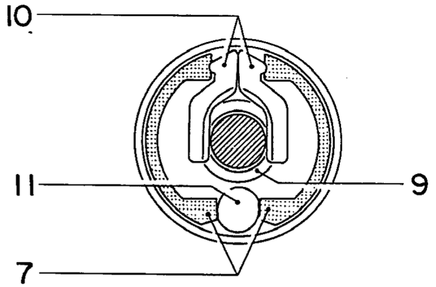

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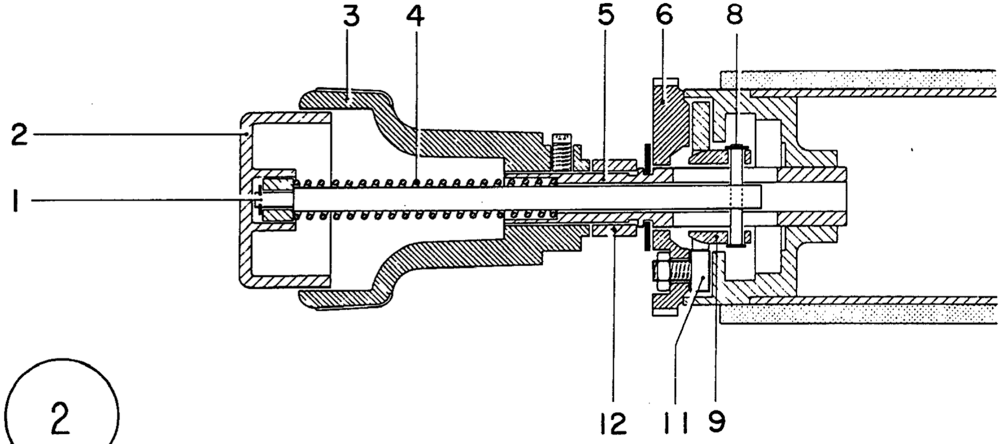


2

PAGE-END INDICATOR

The page-end indicator enables the operator to easily determine the amount of paper remaining at the bottom of the page.

ASSEMBLY (REST POSITION)

The page-end indicator comprises the following (figures 5 and 6):

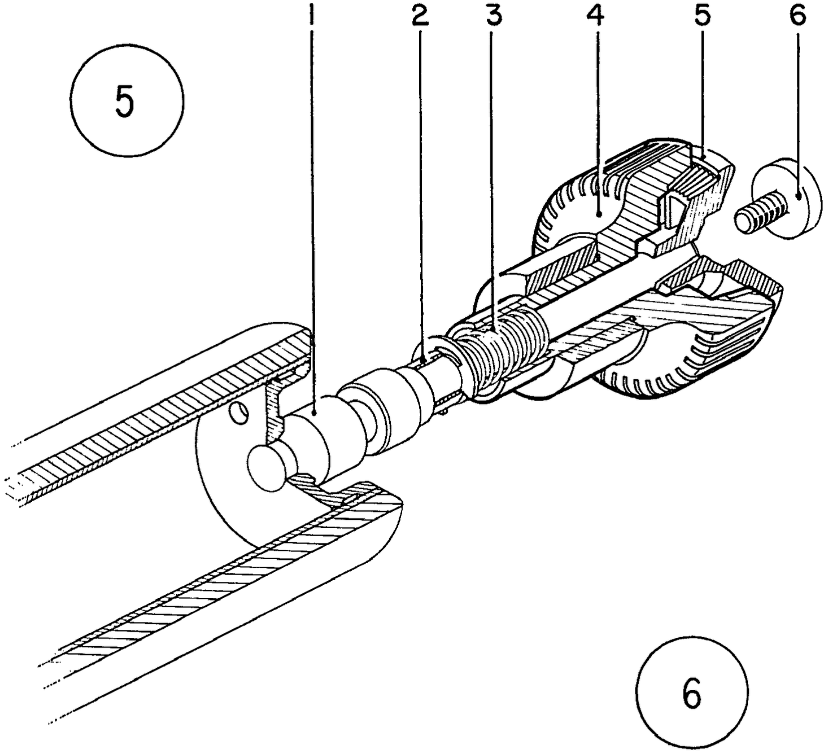
- Platen shaft (1)
- Platen shaft bushing (2)
- Compression spring (3)
- Platen knob with indicator dial (4)
- Page-end indicator cap (5)
- Fastening screw (6)

At rest position, the inner serrations of the platen knob (4) are meshed with the outer serrations of the cap (5) through the tension of the compression spring (3). This causes the platen knob to be integral with the platen.

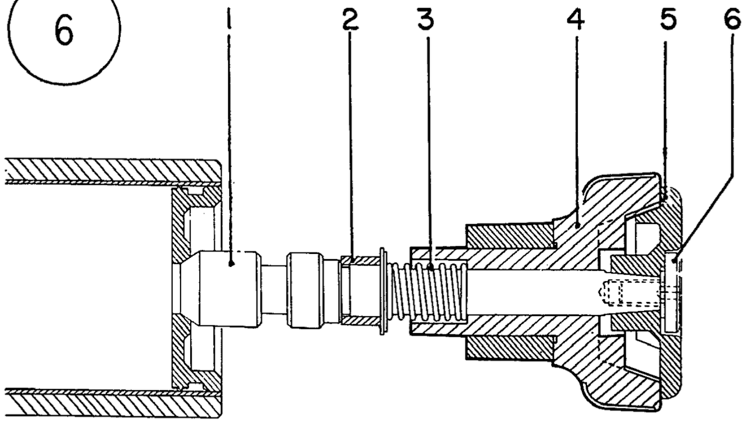
ACTIVATION

When the platen knob (4) is pushed to the left, the spring (3) is compressed, and the knob is free of the cap (5). The platen knob with the indicator dial (4) can now be rotated independently of the platen.

⑤



⑥



SECTION **27**

PAPER FEED,
CARD HOLDER AND ALIGNING SCALE

PAPER FEED

To ensure straight, parallel lines of write, the typing paper must be held firmly against the platen and move evenly and uniformly as the platen rotates. These conditions are assured by the:

- Feed rolls
- Paper bail

The relationship of the feed rolls and the paper bail to the platen can be controlled by the feed roll release mechanism. This mechanism allows repositioning of the paper after insertion into the machine.

ACTIVATION (Figure 1)

The front and rear feed rolls rotate in the feed roll brackets (7). The extension (F) of the feed roll actuating levers (1) holds the feed roll brackets (7) and, therefore, the feed rolls in contact with the platen, through the action of the springs (10). The rear of the actuating levers (1) are positioned over the actuating bail (2). Attached at the right end of the actuating bail is the gear sector (8).

The paper release lever (5) is mounted on the right outer carriage side plate, and rests with its projection (C) against the stop (B) of the carriage side plate. The rest position is maintained by the toggle spring (6). The gear sector of the release lever (5) is meshed with the teeth of the gear sector (8) of the actuating bail (2).

When the paper release lever (5) is moved in the direction of the arrow, it rotates the actuating bail (2). This rotation raises the rear of the actuating levers (1), causing the extensions (F) to lower the feed roll brackets (7) and the feed rolls clear of the platen. The rotation of the paper release lever (5) causes the lug (A) of the release lever, which pushes on the rocker (4), to move the paper bail (3) forward (clear of the platen).

The paper pan aids the insertion of paper into the machine. The pan guides the paper until it is picked up by the feed rolls. The paper pan (9) rests on the feed roll brackets (7), and its position is established by the wings (D), left and right, which are in the slots (E) of the brackets (7).

TRANSPARENT CARD HOLDER AND ALIGNING SCALE

The card holder and aligning scale provide:

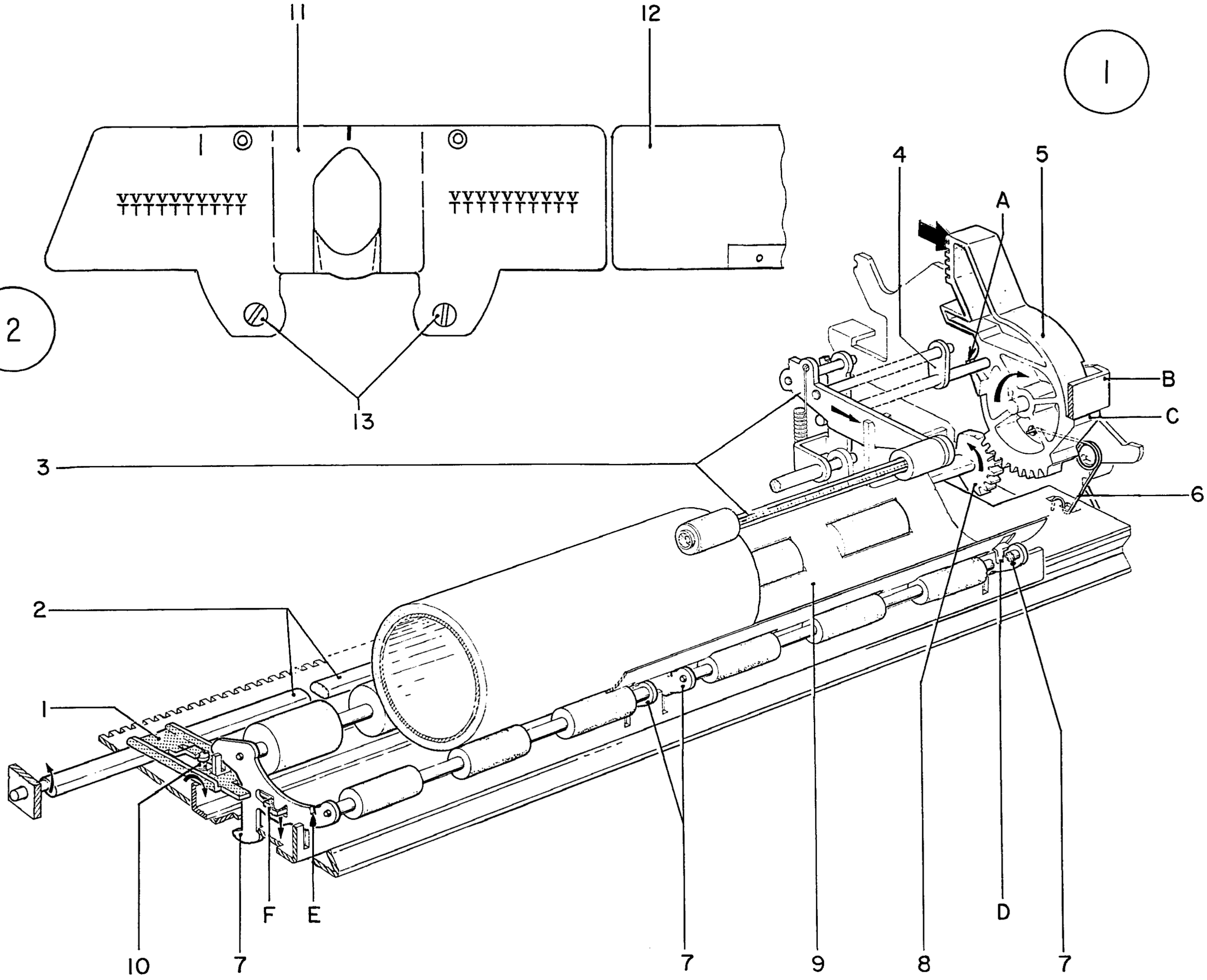
- An accurate guide for locating the paper to any desired writing position.
- A means of guiding the paper under the bail rolls and maintaining it snugly against the platen.

ADJUSTMENTS (Figure 2)

With the platen position dial set at "A", the card holder and aligning scale (11) and paper deflector (12) must safely clear the platen. This is obtained by forming the respective mounting brackets as required.

The aligning scale (11) must be positioned laterally so that the center line of the graduations align centrally with the printed characters. The top of the graduations must be slightly below the printed characters as shown in the figure. This is obtained by positioning the aligning scale both horizontally and vertically by means of the screws (13).

The top edge of the paper deflector (12) must align and be level with the top of the scale (11). This is obtained by vertically positioning the paper deflector bracket by means of its mounting screws (not shown).


A
B
C
D
E
F

SECTION 28

HINGED TOP COVER SAFETY LATCH

HINGED TOP COVER SAFETY LATCH

The machine is designed with a hinged top cover to facilitate the changing of the ribbon, the cleaning of type, etc. When the motor switch is in the OFF position, the hinged top cover can be opened. When the motor switch is in the ON position, the hinged top cover is locked and cannot be opened.

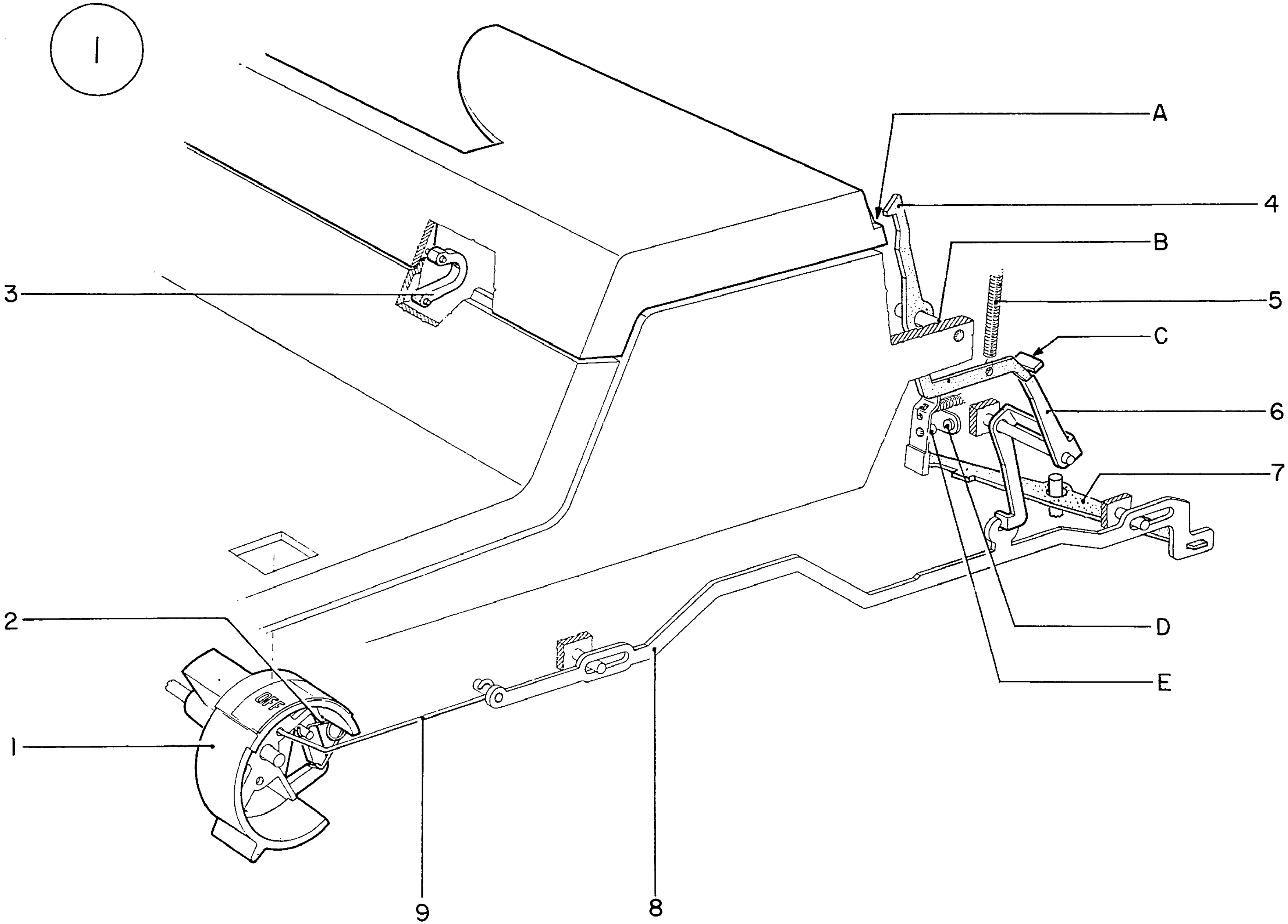
ASSEMBLY REST POSITION (MOTOR SWITCH OFF)

Figure 1 shows the hinged top cover and the motor switch dial (1) in the OFF position.

In this position:

- The motor switch dial is held by the detent spring (2), and the links (9 and 8) are positioned towards the rear of the machine.
- The link (8) maintains the intermediate lever (7) in position to keep the motor circuit contacts (E and D) open.
- The link (8) also positions the safety latch (4), through the wing (C) of the bridge (6), so that it is clear of the step (A) of the top cover.

The hinged top cover is connected to the keyboard cover by the hinges (3). (Only the hinge on the right side is shown in the figure. There is a similar hinge on the left-hand side of the top cover.)


A
B
C
D
E
OFF

ACTIVATION (MOTOR SWITCH ON)

Figure 2 shows that the motor switch dial (1) has been rotated to the ON position.

This movement caused:

- The links (9 and 8) to move towards the front of the machine, as indicated by the arrows.
- The intermediate lever (7) to rotate, thus closing the motor circuit contacts (E and D).
- The bridge (6) to rotate in the direction of the arrow, and its wing (C) to release its hold on the safety latch (4).
- The safety latch (4) to rotate on the stud (B) and position over the step (A) of the top cover by means of the spring (5).

The top cover will remain locked by the safety latch (4) until the motor switch dial (1) is moved to the OFF position.

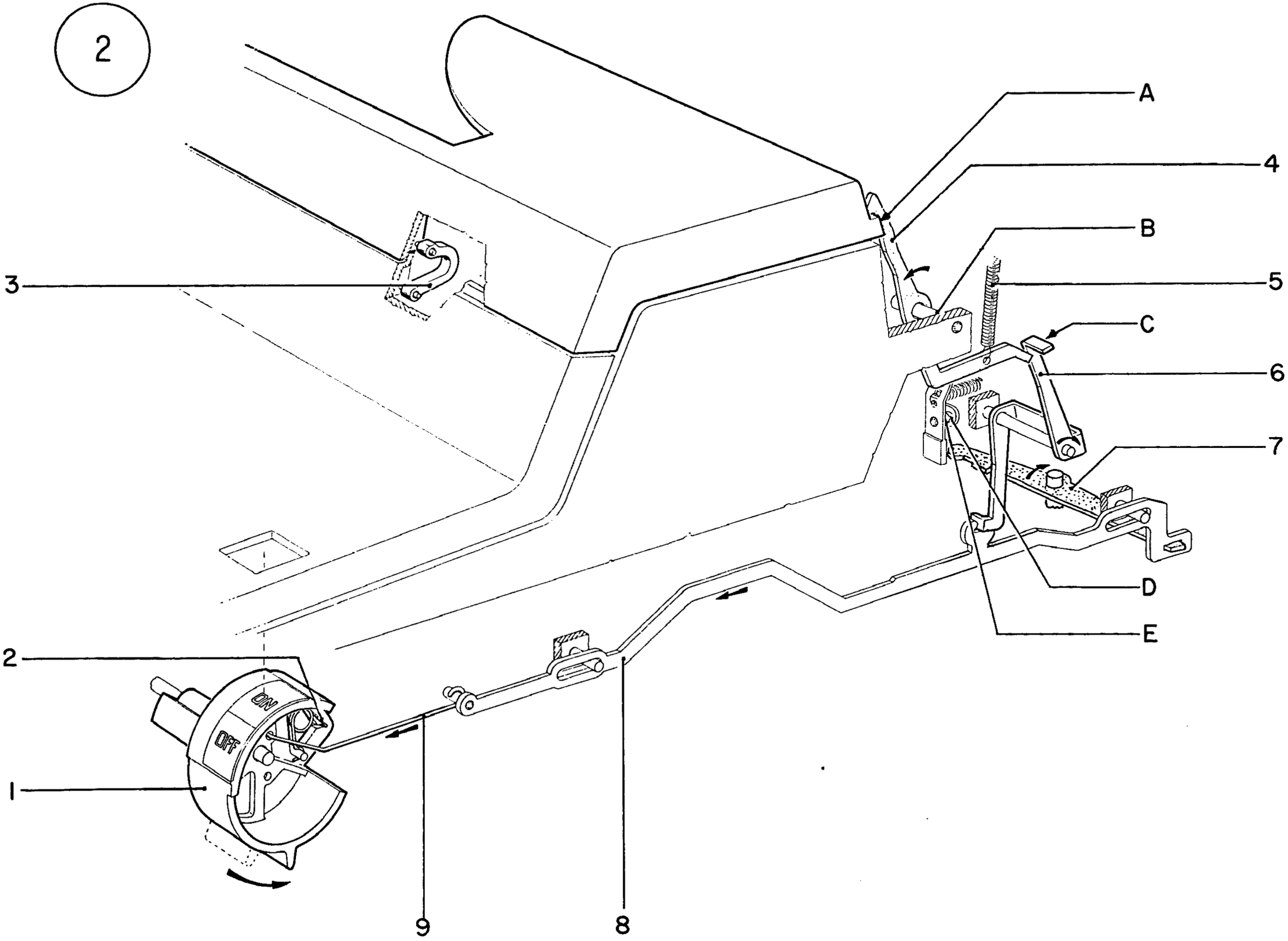
ADJUSTMENT

HINGED TOP COVER SAFETY LATCH ADJUSTMENT

With the hinged top cover closed and the motor switch dial (1) in the OFF position, the safety latch (4) must be to the rear of step (A) and not interfere with the movement of the top cover.

With the motor switch dial (1) in the ON position, the safety latch (4) must be fully engaged over the step (A) to securely lock the top cover.

The above conditions are obtained by forming the beam of the bridge (6).


2
A
4
B
3
5
C
6
7
D
E
2
ON
OFF
1
9
8

SECTION 29

POSITIONS OF ESCAPEMENT RACK, MARGIN STOP RACK, AND TABULATOR STOP RACK

POSITIONS OF ESCAPEMENT RACK, MARGIN STOP RACK, AND TABULATOR STOP RACK

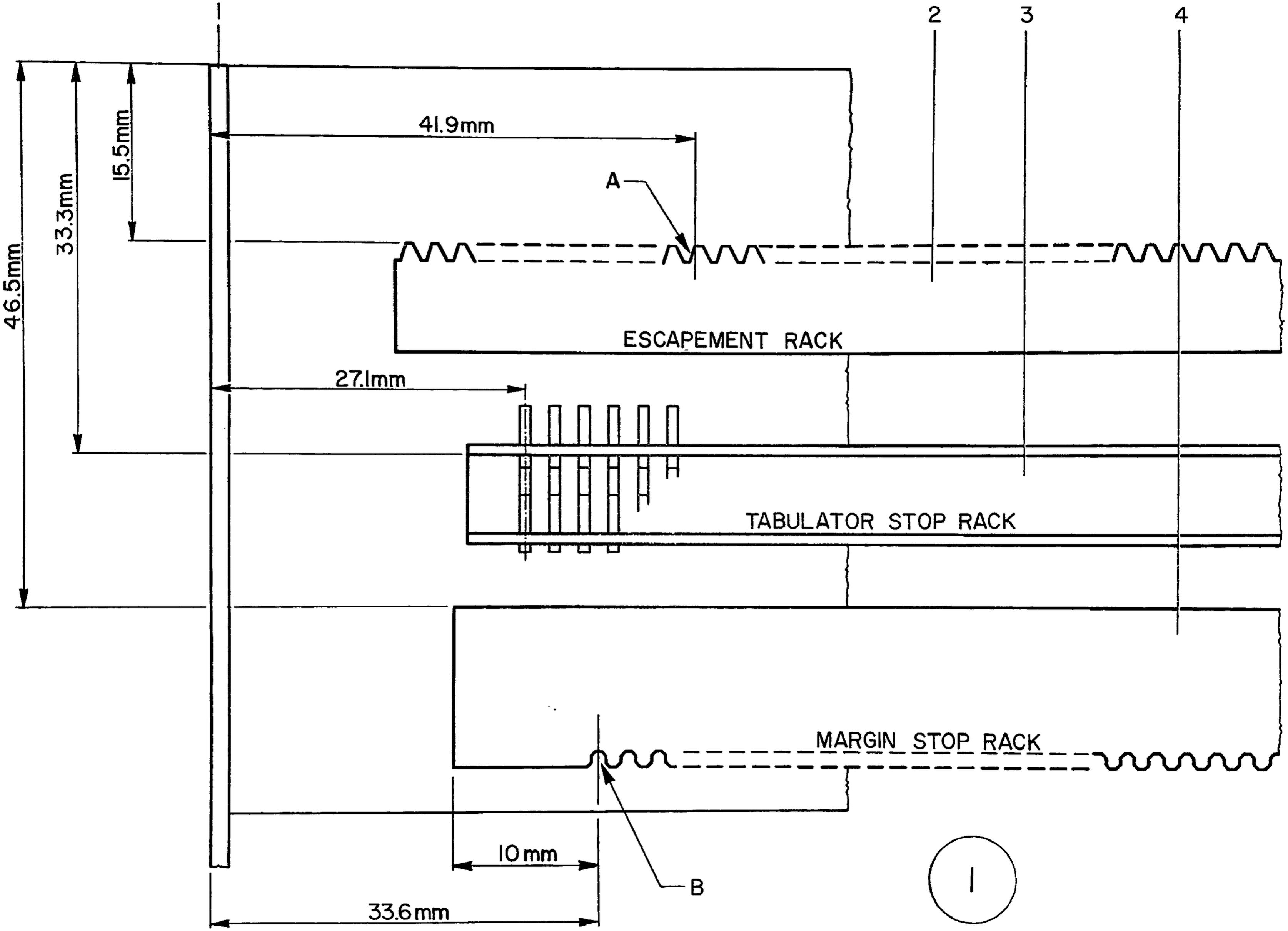
Figure 1 illustrates the three racks and their relative position to each other and to the carriage left outer side plate (1).

The letter B indicates the first usable notch of the margin stop rack. The left margin stop is located in this notch when the left margin is set at zero.

The distance from the outer side wall (1) to the tooth A of the escapement rack is the same, regardless of the pitch of the machine. However, the number of teeth to the left of tooth A varies according to the pitch, as follows:

Pitch	Spacing (mm)	Number of teeth to the left of tooth A
8	3.14	8
10	2.54	10
12	2.12	12
16	1.57	16

The front to rear position of the racks must be the same on both ends of the carriage to ensure parallelism of the racks with the carriage.


1
2
3
4
41.9mm
15.5mm
33.3mm
46.5mm
A
ESCAPEMENT RACK
27.1mm
TABULATOR STOP RACK
MARGIN STOP RACK
10mm
33.6mm
B
1

SECTION 30

CARBON RIBBON MECHANISM

(EDITOR 4C)

EDITOR 4C (CARBON RIBBON MACHINE)

The Editor 4C is basically the same typewriter as the Editor 4, except that the Editor 4C is designed to use a carbon ribbon instead of a fabric ribbon.

The ribbon mechanism differs considerably from that of the Editor 4 in the areas of ribbon travel, lift and feed. This section deals primarily with the differences between the carbon ribbon mechanism and the fabric ribbon mechanism.

CARBON RIBBON

The polyethylene carbon ribbon used on the Editor 4C provides maximum sharpness and clarity of the printed characters. The back surface of the polyethylene ribbon has a thin coating of carbon which is transfered to the paper by the character on the type slug as it reaches the printing point. Slight variations in the impact of the type as it strikes the platen is not as perceptible with the carbon ribbon due to the high degree of carbon transfer during typing.

CARBON RIBBON SUPPLY AND TAKE-UP MECHANISM

The carbon ribbon supply spool (1) is located in the supply spool bracket (2). The carbon ribbon travels:

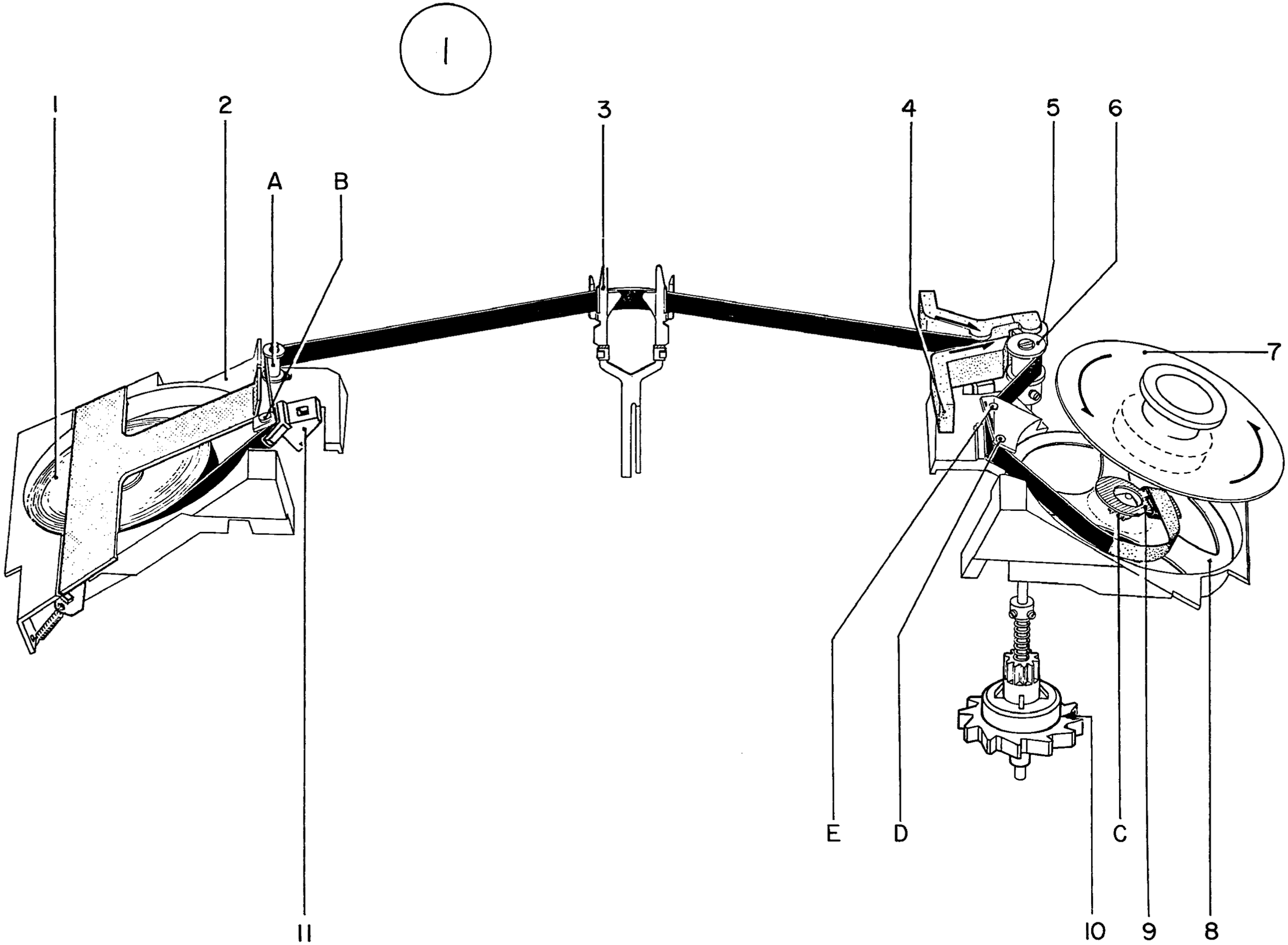
- Between the guide roller (B) and the pad of the carbon ribbon brake lever (11).
- Around the flexible guide roller (A).
- Through the ribbon guide (3).
- Between the pressure roller (5) and feed roller (6).
- Around the guide rollers (E and D).

The adhesive end of the carbon ribbon is attached to the plastic ring (9) as indicated in figure 1. The plastic ring is looped over the knurled hub (C) of the take-up spool (8). The top cover (7) is then placed on the hub (C) with sufficient pressure to secure the plastic ring to the take-up spool (8). The lever (4) facilitates the insertion of the ribbon between the rollers (5 and 6).

The ribbon feed is accomplished, during every printing cycle, through the rotation of the feed roll (6) and the pressure roll (5). At the same time that the ribbon feeds, the take-up spool (8) rotates to take up the used portion of the ribbon. The take-up spool (8) is driven through the gear of the slip clutch assembly (10) and a gear train (not shown in figure).

The slip clutch assembly (10) is designed to allow a constant take-up of the used portion of the ribbon, without causing the ribbon to be pulled through the feed and pressure rollers as the diameter of the ribbon increases.

The pad of the carbon ribbon brake lever (11) applies a slight drag on the ribbon, thereby preventing the ribbon from developing slack during typing. The braking action on the ribbon is automatically released, in proportion to the ribbon becoming taut, through the yielding action of the roller (A). This action assists in maintaining a uniform tracking and lift of the carbon ribbon.


A
B
E
D
C

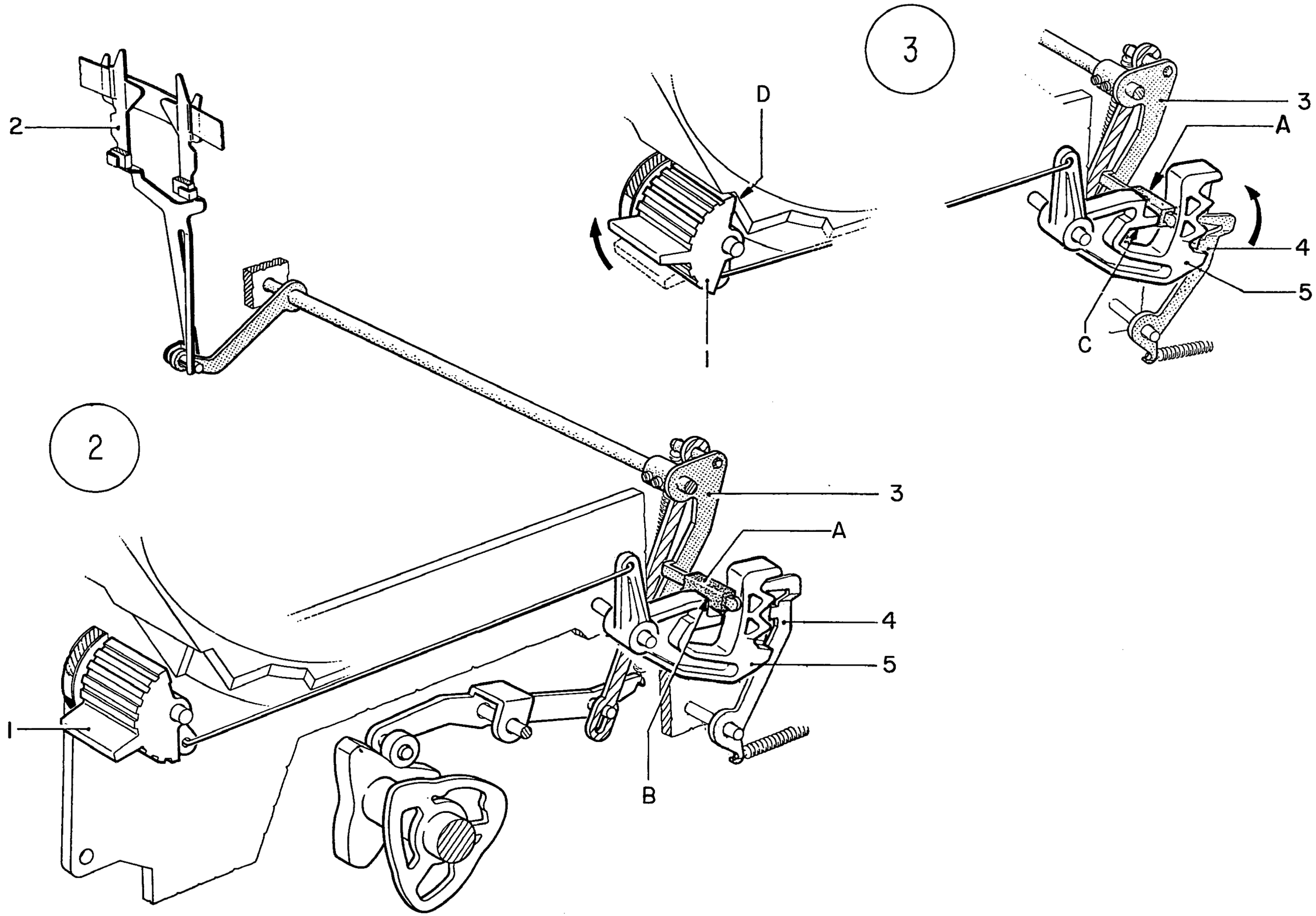
RIBBON LIFT

The ribbon lift mechanism of the Editor 4C works exactly the same as on the Editor 4. The ribbon guide (2), however, is designed slightly different to accommodate the narrower 5/16-inch wide carbon ribbon, and the ribbon selector lever (1) assumes only two positions: black or stencil.

Figure 2 shows the ribbon selector lever (1) in the black position. In this position, the detent (4) holds the sector (5) so its upper step (B) is in line with the rubber bumper (A) of the control arm (3). During a print cycle the bumper (A) rotates forward and limits against the step (B), allowing the ribbon guide (2) to rise.

Figure 3 indicates that the ribbon selector lever (1) has been moved to the stencil position. (The ribbon selector lever (1) cannot be rotated beyond the stencil position because in this position it limits against the ribbon spool take-up bracket as at D.)

With the ribbon selector lever (1) in stencil position, the detent (4) holds the sector (5) so its extension (C) is in line with the bumper (A). During a print cycle the control arm (3) is unable to rotate, and the ribbon remains at rest.


3
D
3
A
4
5
C
I
2
2
3
A
4
5
I
B

RIBBON FEED MECHANISM (REST POSITION)

Figure 4 shows the ribbon feed mechanism at rest position, and the ribbon selector lever (12) set in the black position.

In this position, the ribbon feed control lever (10) is at rest against the extension of the guide plate (11) through the tension of spring (9).

With the control lever (10) at rest, its spur (E) is in the path of the ribbon feed pawl (8), as indicated in the lower right inset.

The rest position of the feed pawl (8) is established laterally by the stud (A) against the support bracket, and front to rear by the end of the slot in the guide plate (11) and the drive link (13). The feed pawl (8) is held against these resting points by the tension of spring (7). Refer to the upper left detailed inset.

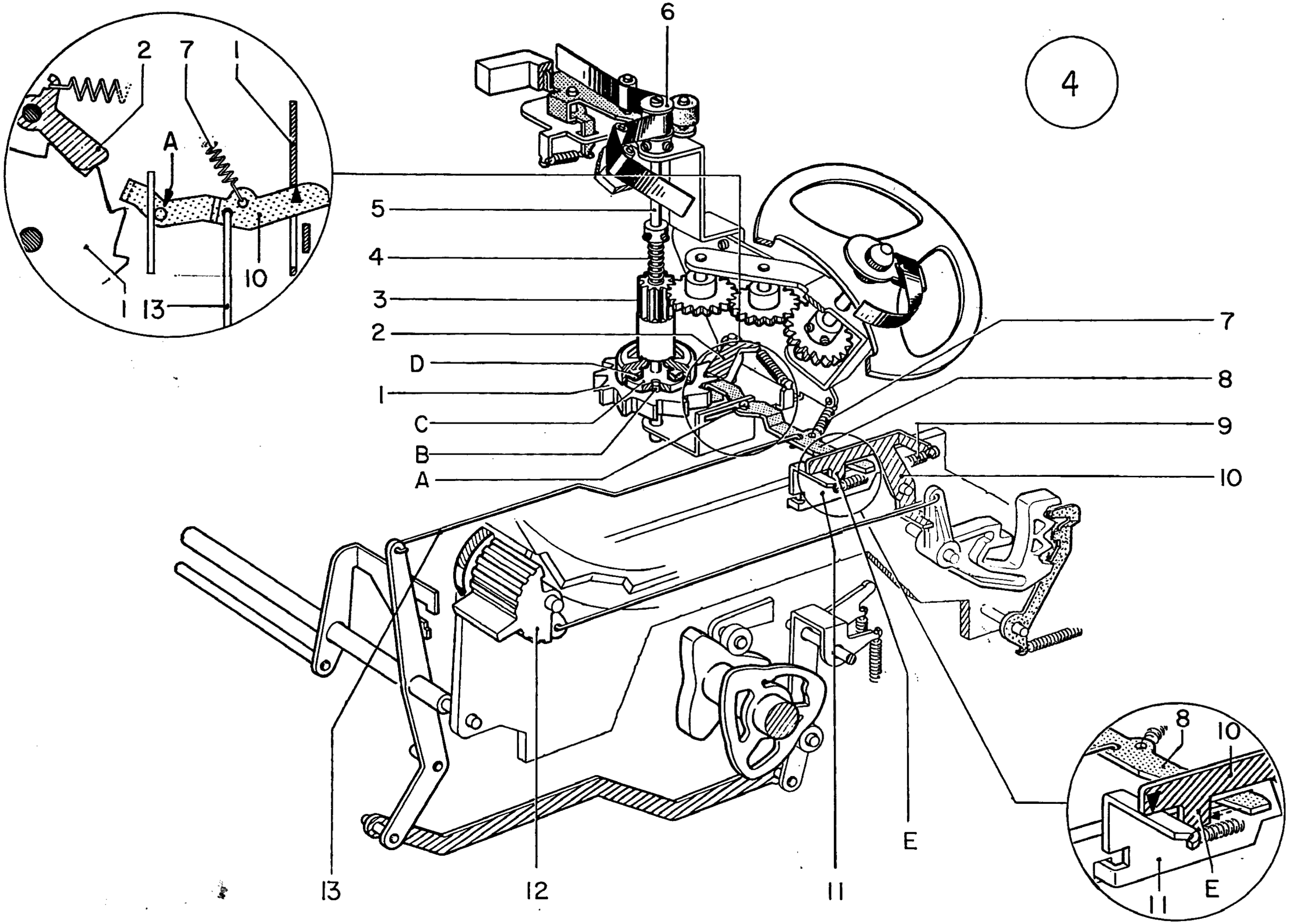
The ribbon feed ratchet (1) is held detented by the check pawl (2).

The ribbon feed ratchet (1) is coupled to the ribbon feed roll shaft (5) by the stud (B) which is keyed to ribbon feed shaft disk (C). The feed roller (6) is secured to the upper end of the feed roll shaft (5).

The compression spring (4) applies downward pressure to the clutch assembly, causing a friction drive between the cork ring (D) and the disk (C).

The pinion gear (3) of the clutch assembly is meshed with the gear train of the carbon ribbon take-up spool.

④



ACTIVATION

Figure 5 and upper left inset show the ribbon feed mechanism at rest position.

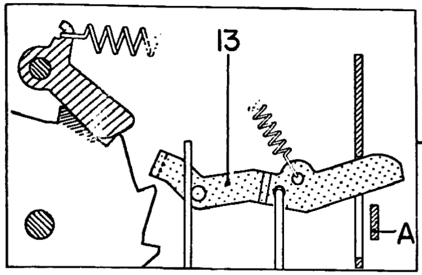
During a print cycle, the escapement trip profile (B) of the print cam group rotates and actuates the parts (15, 16 and 1), as indicated by the arrows, in the same manner as for the Editor 4. Through this action, the ribbon drive link (2) is pulled forward and, in turn, actuates the ribbon feed pawl (13) in the direction of the arrows.

Figure 6 shows that as the drive link (2) and feed pawl (13) are pulled forward, the feed pawl comes in contact with a tooth of the ratchet (3) and spur (A) of the control lever (14).

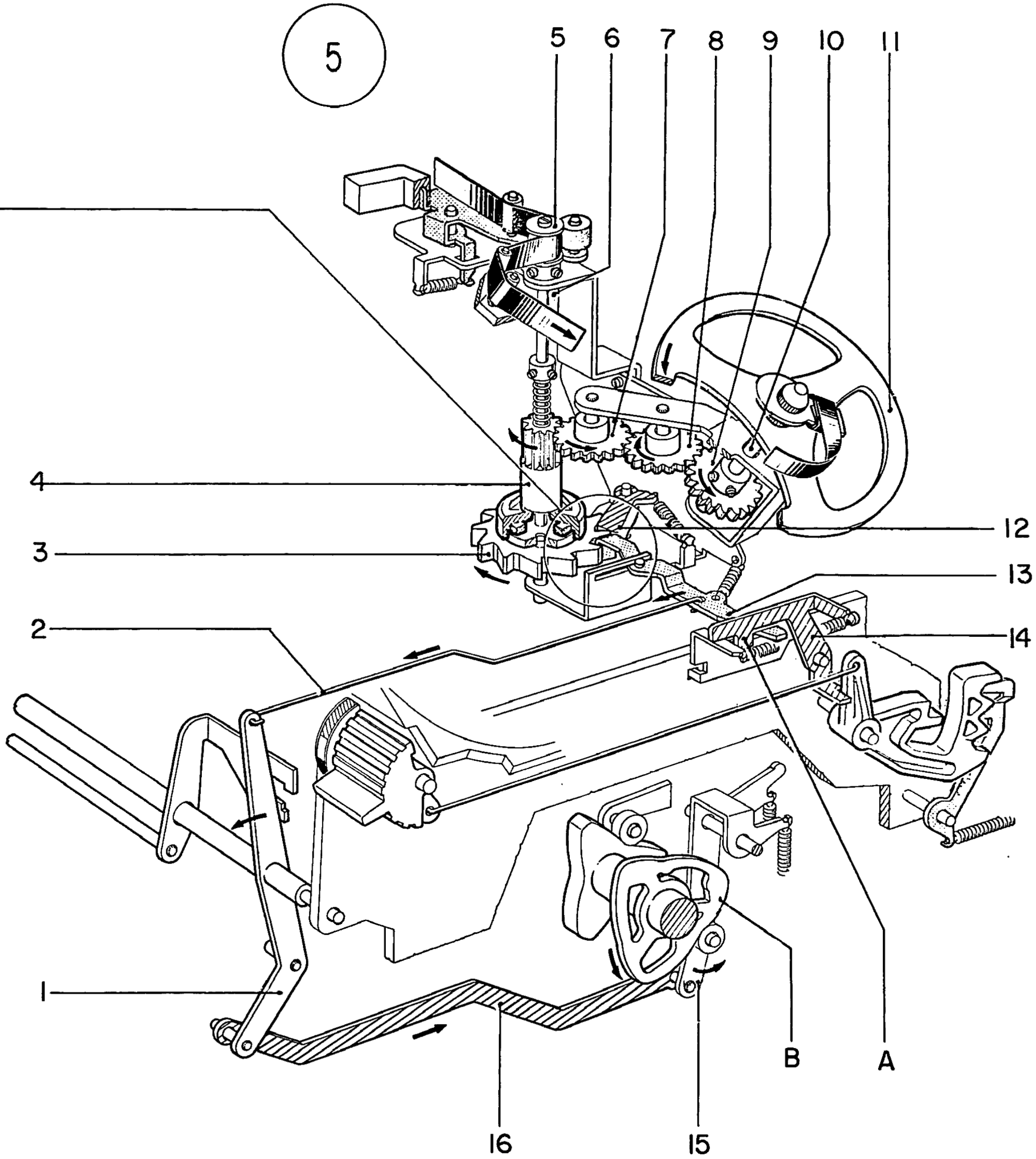
Figure 7 shows that the drive link (2) has completed its forward travel. Through this action, the right end of the feed pawl (13) pivoted on spur (A) while the left end rotated forward, advancing the ratchet (3) one tooth.

The check pawl (12) prevents the ratchet from moving backwards as the feed pawl restores.

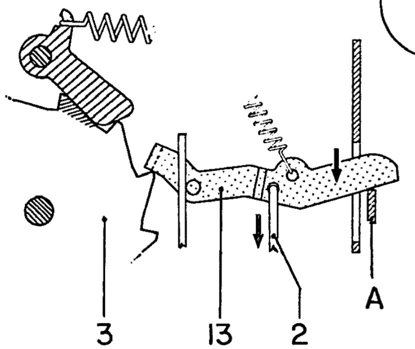
Rotation of the ratchet (3) causes the ribbon feed roll shaft (6) and feed roller (5) to rotate, thereby advancing the ribbon a predetermined amount during each print cycle. At the same time, the rotation of the ratchet also rotates the friction clutch assembly (4), gears (7, 8 and 9), shaft (10) and take-up spool (11).



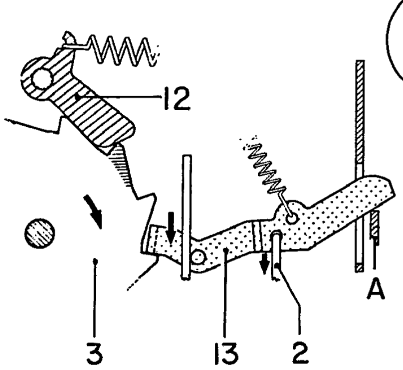
5



6



7

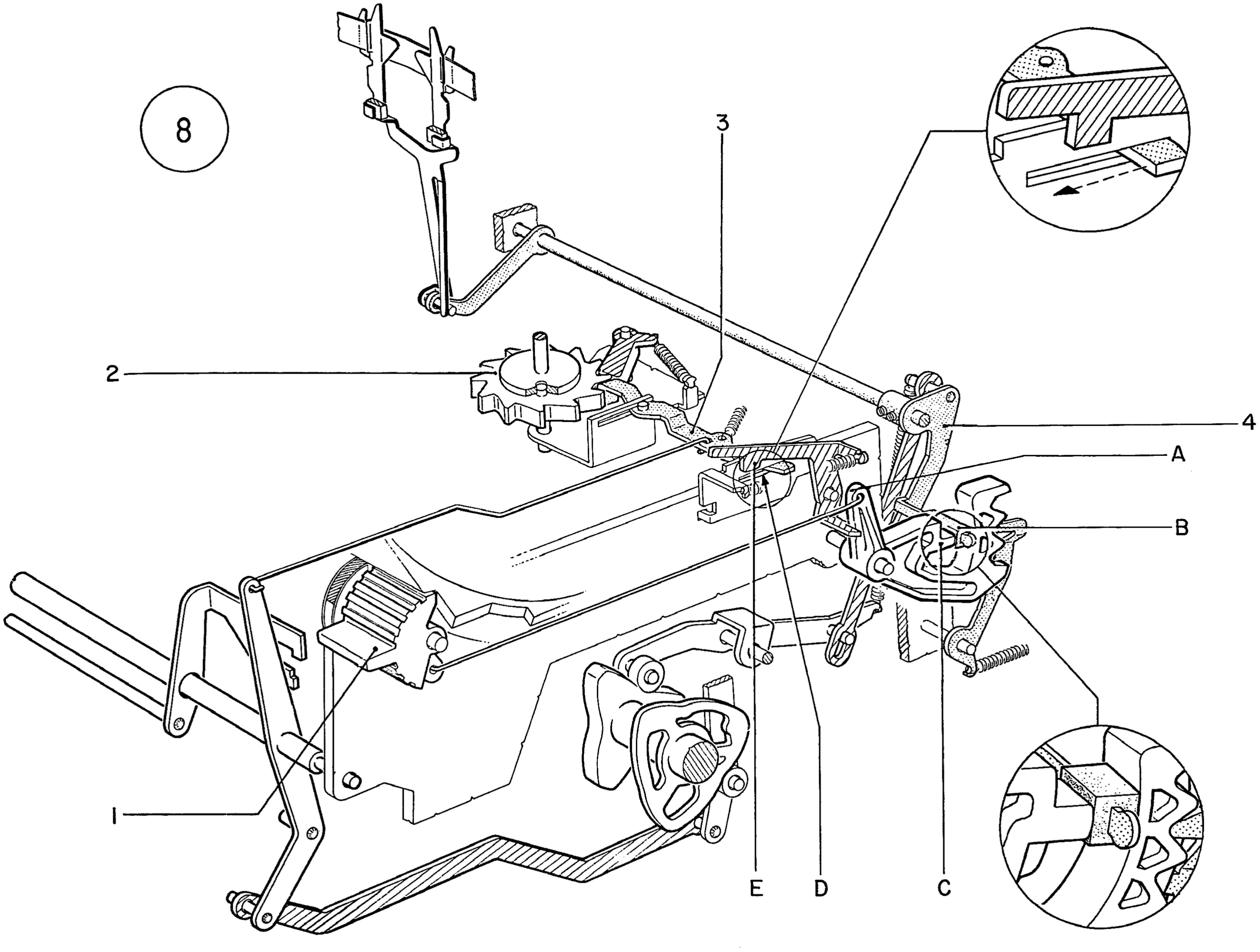


RIBBON FEED ELIMINATION (STENCIL POSITION)

When the ribbon selector lever (1) is set in the stencil position, the ribbon feed must be prevented from occurring to avoid waste of the carbon ribbon when typing on stencils.

Figure 8 shows the ribbon selector lever (1) set in the stencil position. With the machine in this position, the following two conditions exist:

- The arm (A) of the sector has rotated the ribbon feed control lever, placing its spur (E) above, and out of the path of the feed pawl (3). (See upper right inset.) During a print cycle, the right end of the feed pawl (3) will move forward in the guide slot (D) while the left end of the feed pawl pivots on a tooth of the ratchet (2). The ribbon is thereby prevented from feeding.
- The extension (C) of the sector is in line with the rubber bumper (B) of the ribbon lift control arm (4), thereby preventing the ribbon from rising during a print cycle. (See lower right inset.)

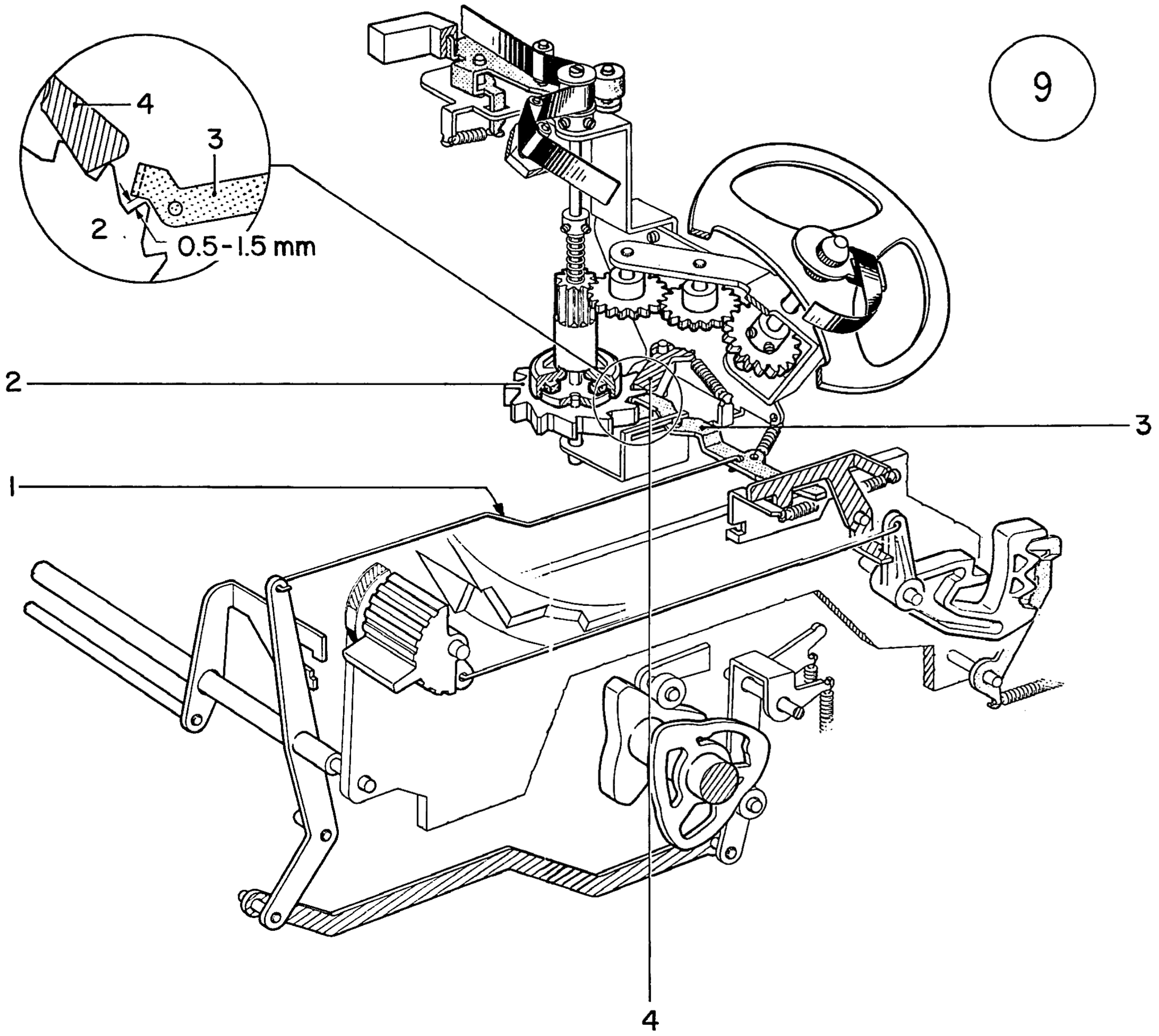

8
3
2
4
A
B
1
E
D
C

CARBON RIBBON FEED ADJUSTMENT

To ensure the proper feeding of the ribbon, the ratchet (2) must advance one tooth during each print cycle.

With the machine at rest, and the detent (4) securely holding the ratchet (2), there should be a clearance of 0.5 to 1.5 mm between the wing of the feed pawl (3) and a tooth of the ratchet. (Refer to the upper inset.)

To obtain the above clearance, form the offset portion of the feed pawl drive link as at (1) to lengthen or shorten the link, as required.


0.5-1.5 mm

CARBON RIBBON FEED DRIVE ADJUSTMENTS

The feed roll shaft (4) must have a minimum of vertical movement.

To adjust, loosen the two set screws (8), and position the feed roller (6) on the shaft (4) as required. Tighten the set screws.

The pressure roller (7) must have a parallel contact to the feed roller (6) to ensure proper tracking of the ribbon.

To adjust, form the pressure roller support bracket (5) as required.

The carbon ribbon take-up drive gear (10) should mesh as deeply as possible without bottoming in the slip clutch pinion gear (1).

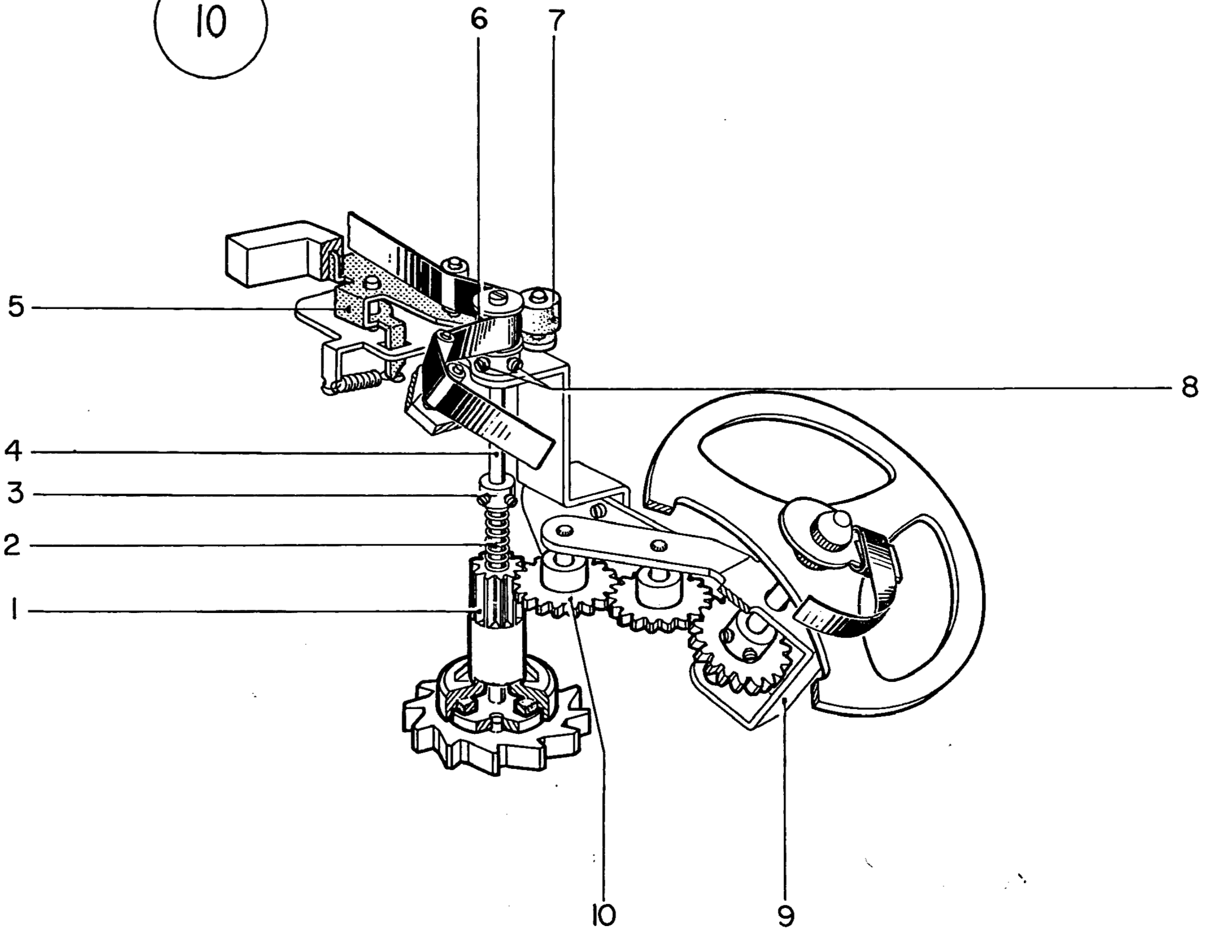
To adjust: Loosen the two fastening screws (not illustrated) which secures the carbon ribbon take-up spool bracket (9) to the side plate of the machine. Position the bracket (9) back or forth for proper mesh. Tighten the fastening screws.

CARBON RIBBON SLIP CLUTCH ADJUSTMENT

The carbon ribbon slip clutch assembly must have sufficient friction to positively take up the used portion of the carbon ribbon, without dragging the ribbon through the feed and pressure rollers (6 and 7).

To adjust, position the collar (3) up or down to regulate the pressure applied by the compression spring (2) to the slip clutch assembly.

10



SECTION 31

EDITOR 4 AND 4C
WITH
DECIMAL TABULATION

INTRODUCTION TO DECIMAL TABULATION

The decimal tabulator feature offers a convenient, rapid, and accurate method of tabulating figures that range in value from 1 cent to $9,999,999.99.

The decimal tabulator is especially useful where listings, billing, and statements of tabulated columns of figures are required. This feature permits the operator to tabulate directly to any particular position within the column, such as unit dollar, ten dollar, hundred dollar, etc., merely by depressing the appropriate decimal tabulator key.

Tabulator stops must be preset in positions corresponding to the desired locations of the decimal points.

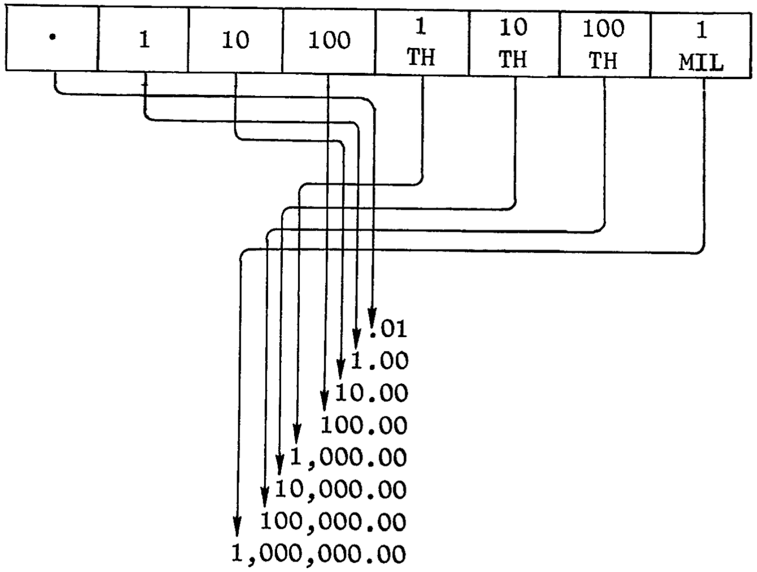
The decimal tabulator mechanism is controlled by eight decimal tabulator key levers and eight corresponding stop blades.

Depression of a decimal tabulator key automatically presets the carriage to stop a given number of spaces to the left of the decimal point, depending on the value of the key depressed.

The decimal point tabulator key ☐ tabulates the carriage to a set tab stop position, and therefore, corresponds to the action of a "tabulator bar."

The stop blades are arranged in an order that automatically provides the spaces required for the typing of the commas.

The following example shows the relationship of the decimal tabulator keys to their respective digit column.



The operation of the decimal tabulator mechanism is basically the same as on the Editor 4 machines with "single key" tabulation (tabulator bar). However, there are numerous operational and mechanical differences to the decimal tabulator mechanism, mainly because of the eight tabulator stop blades which are required to control the varied stopping of the carriage.

The following lists the operational differences of the decimal tabulator mechanism as compared to the "single key" mechanism.

- Both the express margin and reverse tabulation (RT) features are eliminated due to mechanical design changes required for decimal tabulation.
- Repeat (skip) tabulation is eliminated.
- Tabulation can be prematurely stopped with the back space key only.
- The right margin stop has no effect on stopping the carriage during tabulation. The carriage is stopped by either a set tab stop or the right limit stop.

The mechanical differences of the decimal tabulator mechanism are covered in the following pages of this section.

DECIMAL TABULATOR MECHANISM

REST POSITION

Figure 1 shows the decimal tabulator command and action mechanisms at rest position.

The command mechanism works in the same manner as on "single key" tabulator bar machines to activate the service cam.

There are eight decimal tabulator key levers; however, only the 1 MIL decimal key lever (14) is shown with its associated crank (13), activating link (15), and stop blade (9). The remaining seven decimal key levers, and associated parts, are not illustrated since their operation is identical to the one shown.

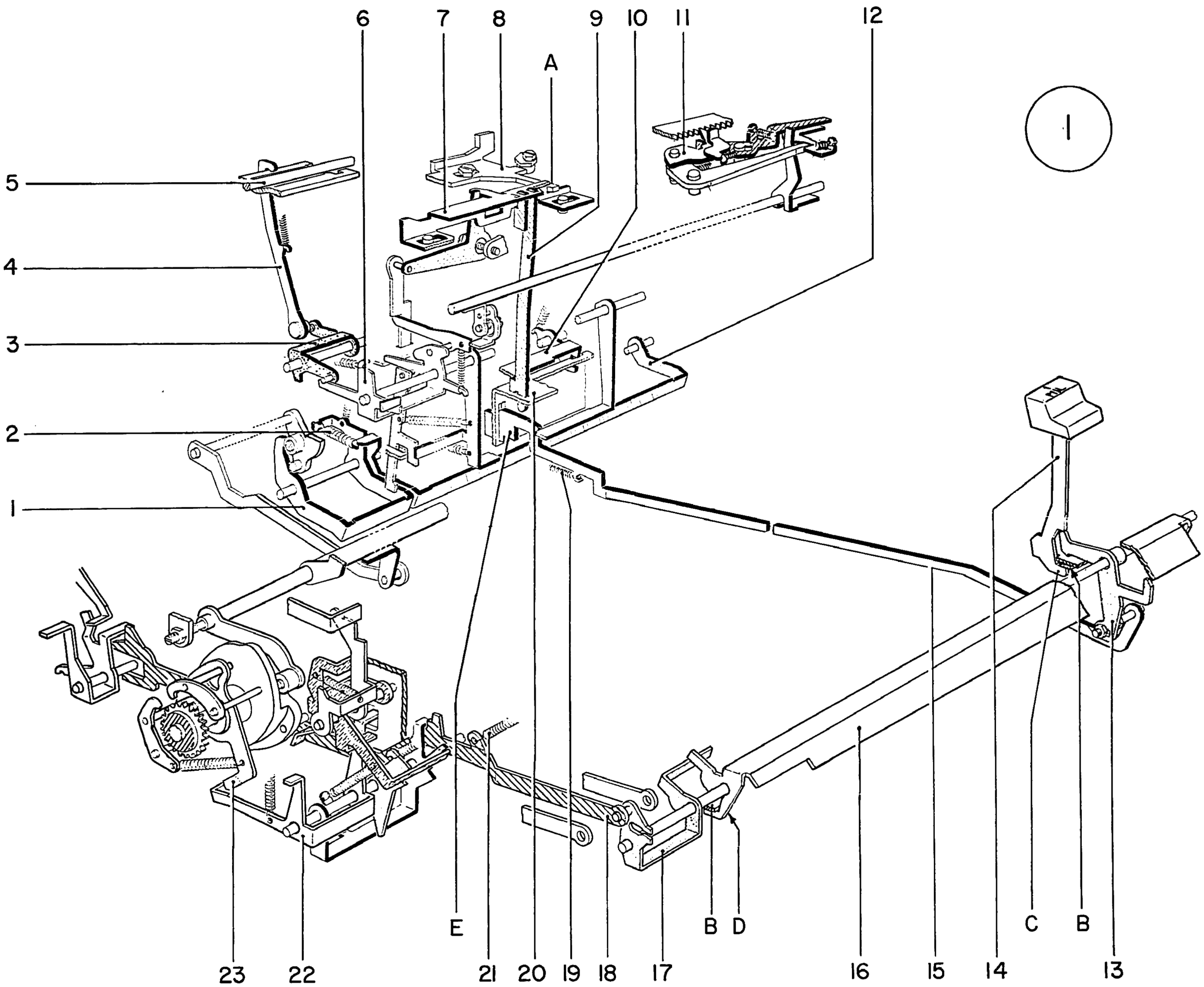
- The extension (C) of the decimal key lever (14) is at rest against the rubber pad (B) of the keyboard frame, through the action of the crank (13), link (15), and spring (19). With the activating link (15) at rest, its step (E) is out of the path of the universal bar (12).
- The extension (D) of the service cam activating bail (16) is at rest against the rubber pad (B), through the action of the bridge (17), trip link (18), and spring (21).
- The starting lever (22) is holding the flange (23), thereby keeping the service cam clutch disengaged.

The action mechanism which controls the raising of the selected stop blade (9) has been changed from that of the "single key" tabulator bar machine.

- There are eight stop blades assembled side by side in the "service unit." The upper end of each stop blade is located in its respective slot in the guide plate (7). The spacing between each stop blade is equal to the pitch of the machine, and is described in detail later in this section.
- The vertical rest position of the eight stop blades (9) is determined by the comb (20), and the retaining bail (10).
- The horizontal rest position of the stop blades is determined by the guide plate (7) being at rest against extension (A) of the service plate (8).
- The rest position of the margin control plate (5) is established by the arm (4) and bridge (3) being at rest against the extension on the escapement release bail (6).

There are two universal bars (small and large) that control the decimal tabulator action mechanism.

- The small universal bar (1) offers a direct drive from the service cam to release the escapement dog (11) from the rack.
- The large universal bar (12) is coupled through the spring (2) to the small universal bar (1). During a tabulation cycle the large universal bar raises the selected stop blade, but yields through spring (2) in the event a stop blade is restricted from fully rising due to a tab stop being positioned directly over the stop blade.



A
B
B
C
D
E

ACTIVATION

Figure 2 shows the position of the decimal tabulation action mechanism after the service cam (2) has stopped at 90 degrees of the cycle. The 1 MIL decimal key lever had been depressed, placing the step (D) of the activating link (16) in the path of the large universal bar (17). At the same time that the activating link (16) moved forward, it rotated the bail (15) which allowed the plunger (18) to position in the path of the small universal bar (19). Through the action of the command mechanism, the service cam (2) started to rotate.

As the service cam rotates, the reset frame shaft (3) activates the universal bars (19 and 17), through the parts (4 and 5), as indicated by the arrows.

- The rotation of the small universal bar (19) causes the plunger (18) to rise and, in turn, rotates the escapement release bail (10).
- Rotation of the release bail (10) causes the escapement control arm (11) to move forward and rotate the crank (14) together with the escapement dog supplementary release frame (6).

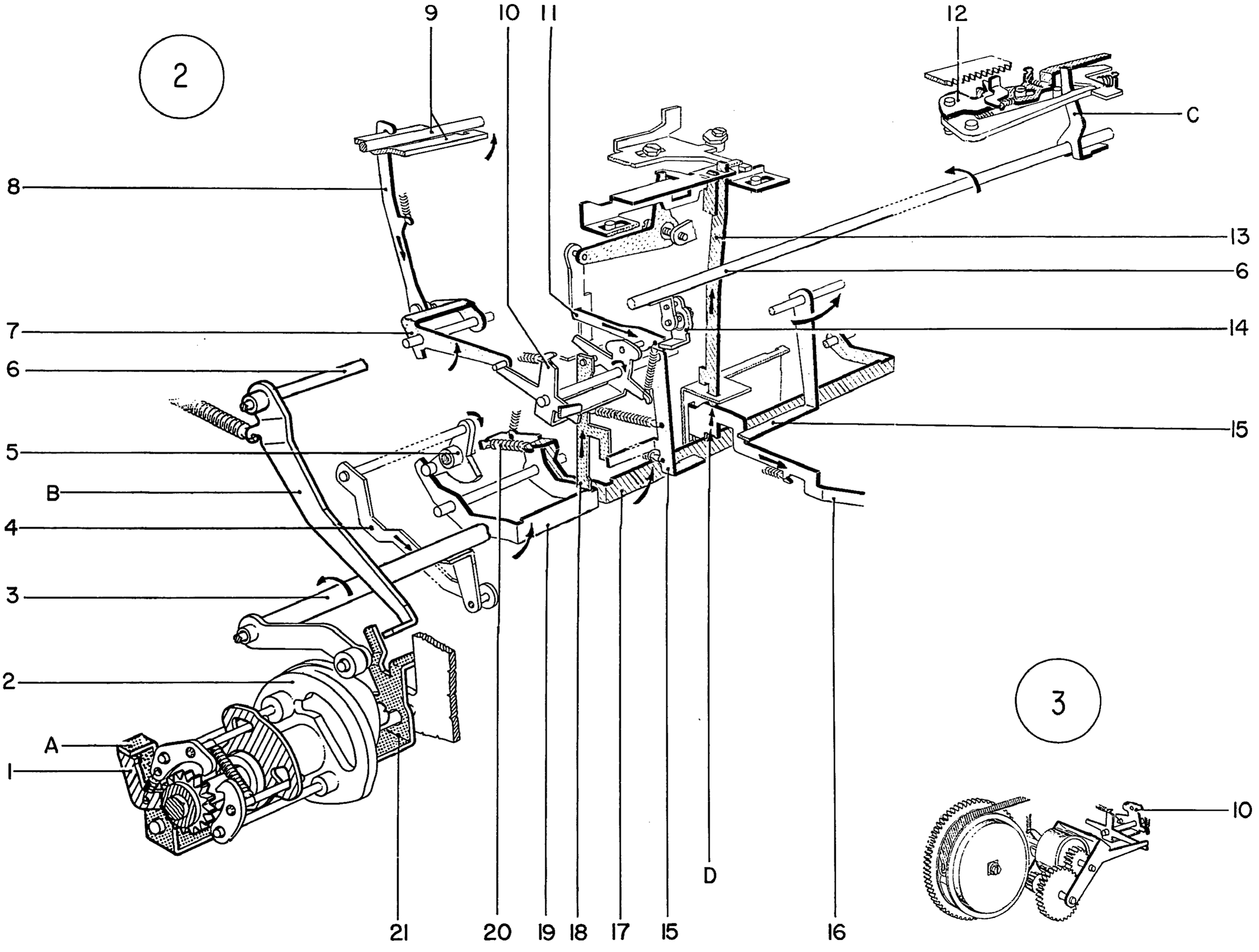
Through the above action the following occur:

- The arm (C) releases the escapement dog (12) from the rack.
- The arm (B) releases its hold on the 90-degree stop lever (21). The stop lever, under the tension of its spring, rotates and places its wing (A) in the path of the flange (1). This presets the stopping of the service cam (2) at 90 degrees of the cycle.
- The rotation of the escapement release bail (10) also rotates the margin control plate (9), through the parts (7 and 8), preventing the right margin stop from stopping tabulation.

When the small universal bar (19) rotated, it also rotated the large universal bar (17) through the coupling spring (20). The rotation of the large universal bar (17) raises the selected activating link (16) and stop blade (13) as indicated by the arrows.

With the decimal tabulator action mechanism in the position shown in figure 2, the carriage is free to tabulate.

During tabulation, the speed of the carriage is controlled by the centrifugal brake assembly (figure [illegible]) in the same manner as on the "single key" tabulat bar machine.


C
B
A
D

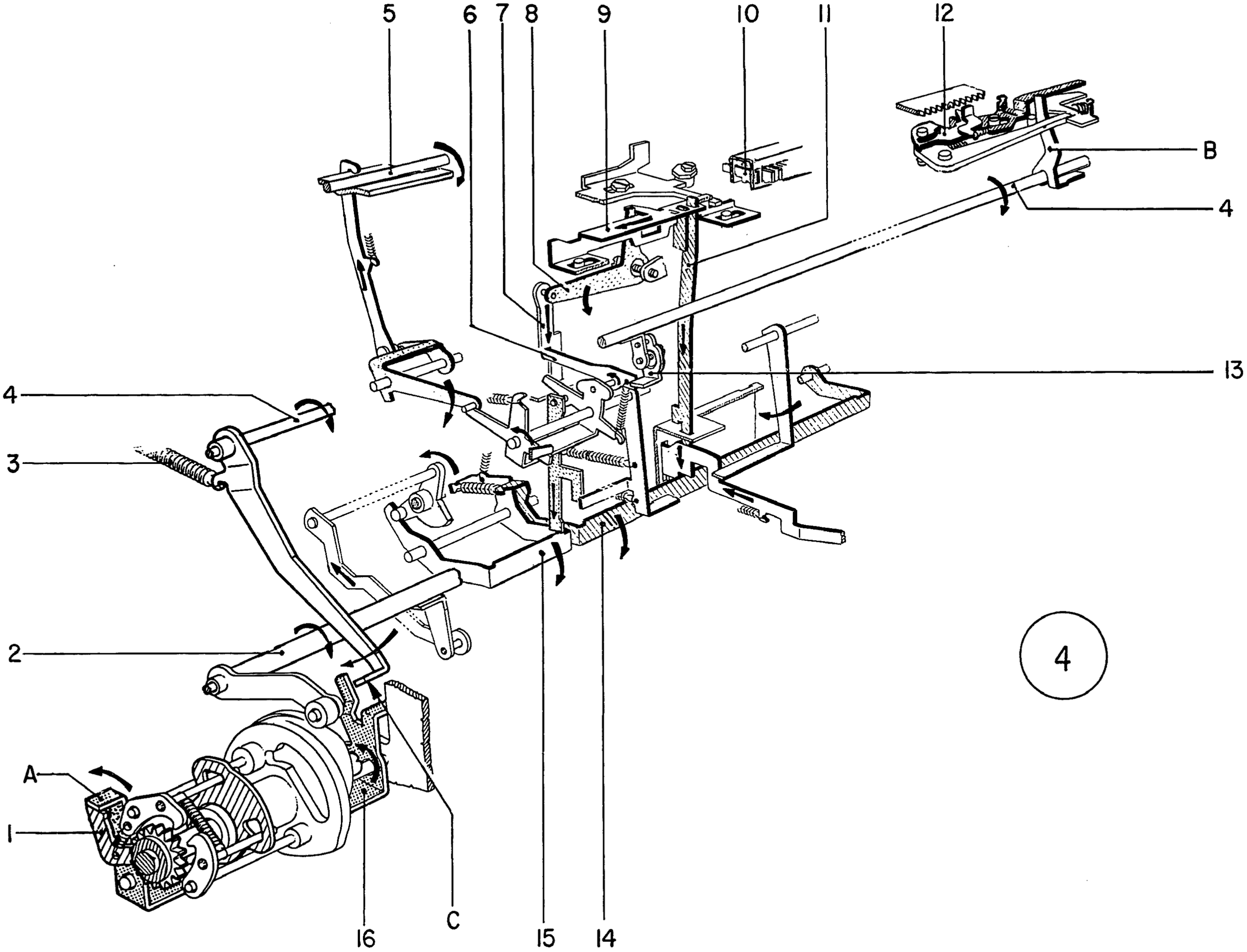
CONCLUSION OF TABULATION (TAB STOP)

The tabulation of the carriage stops immediately after a set tab stop (10) contacts one of the eight decimal tabulator stop blades (11), resulting in:

- The re-engagement of the escapement dog (12) with the rack to stop the movement of the carriage.
- The release of the service cam from the 90-degree position to complete the service cycle.
- The lowering of the selected stop blade (11).
- The disengagement of the centrifugal brake.
- The restoring of the margin control plate (5).

When a set tab stop (10) contacts a stop blade (11), the stop blade and the guide plate (9) move to the left. The movement to the left of the guide plate (9) causes the following actions to take place:

- Actuation of the air cylinder to cushion the stopping of the carriage in the same manner as on the "single key" tabulator bar machine.
- Rotation of the crank (8), lowering the plunger (7) and, in turn, rotating the escapement control arm (6).
- The forward end of the arm (6) rises, and releases its hold on the crank (13).
- When the crank (13) is released by the arm (6), the spring (3) rotates the escapement dog supplementary release frame (4) in the direction of the arrow. Through this rotation, the arm (B) allows the escapement dog (12) to re-engage with the rack. At the same time, the wing (C) rotates the 90-degree stop lever (16) in a counterclockwise direction, releasing its wing (A) from the flange (1). The service cam clutch engages, and the service cam completes the cycle. The restoring of the reset frame shaft (2) and universal bars (14 and 15) allow the tabulator action mechanism to return to rest position as indicated by the arrows, completing the tabulation cycle.


B
A
C

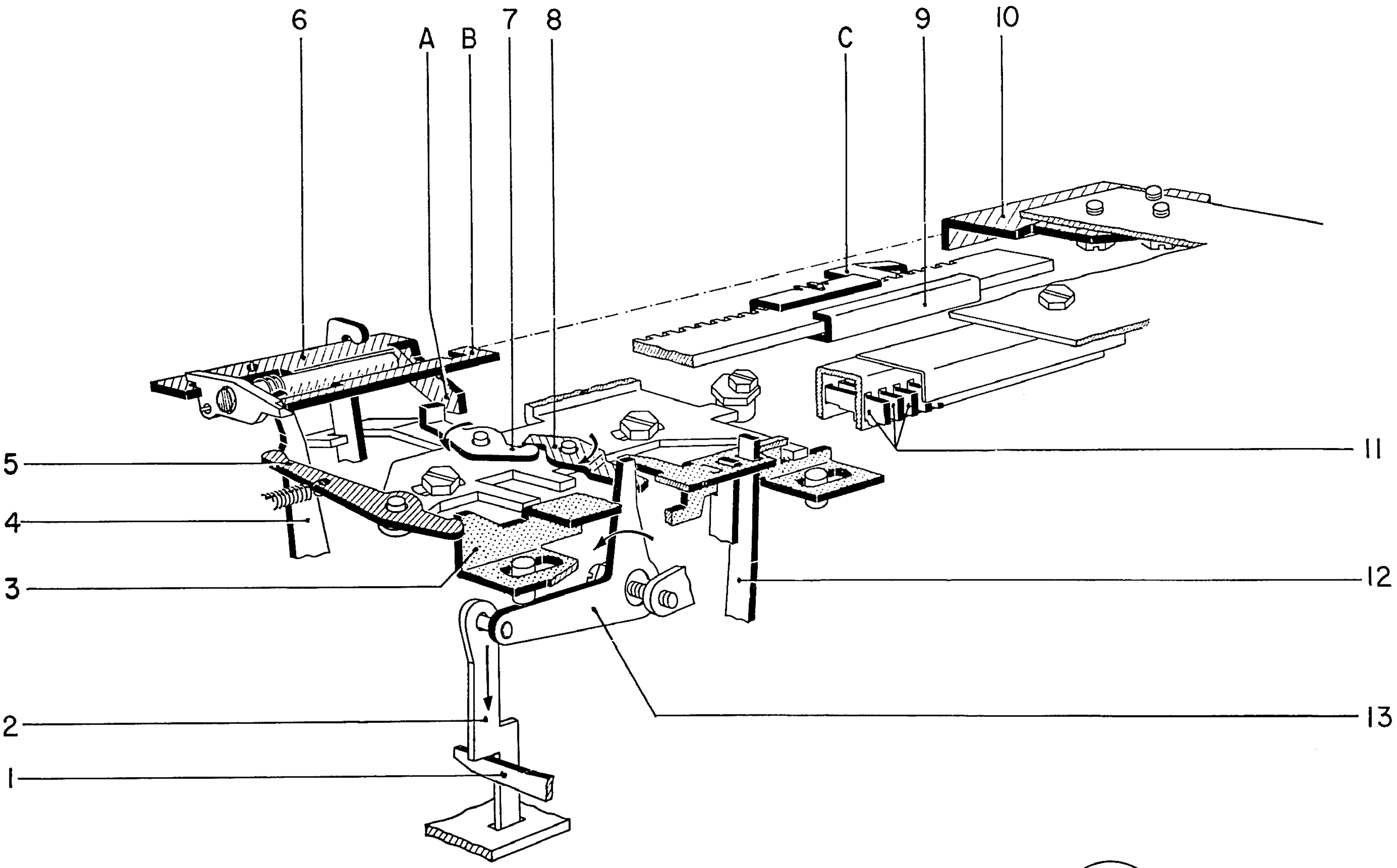
CONCLUSION OF TABULATION (RIGHT LIMIT STOP)

Figure 5 indicates that the machine is in tabulation. The selected stop blade (12) is up, but there are no tab stops (11) set.

The margin control plate (6) has rotated, placing its extension (B) above the wing (C) of the right margin stop (9), as indicated by the dotted line in the figure. Therefore, with no tab stops set, the carriage will tabulate its entire length, and the tabulator mechanism will release when the right limit stop (10) contacts the extension (B) margin control plate (6).

When the right limit stop (10) contacts the extension (B), the margin control plate (6) is driven toward the left. Through this movement, the extension (A) causes the two rockers (7 and 8) and crank (13) to rotate in the direction indicated by the arrows. The plunger (2) is lowered, and the escapement control arm (1) releases the tabulator mechanism in the usual manner.

The air cylinder (not illustrated) did not function during the above operation since there was no actuation of the guide plate (3) and levers (4 and 5).


A
B
C

⑤

Figure 7 shows a top view of the decimal tabulator stop blades guide plate.

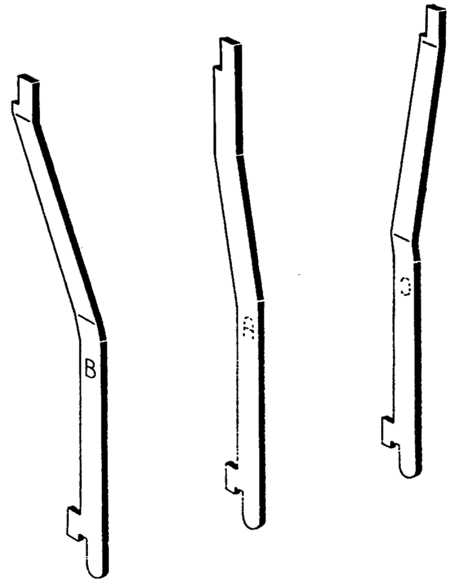
There are 11 parallel slots in the guide plate that provide for different positioning of the stop blades to accommodate various methods of columnar listing. The layout of the stop blades in figure 7 is in accordance with the decimal tabulator system used in the U. S. A.

The spacing between the slots in the guide plate is determined by the pitch of the machine. The stop blades, therefore, are designed in different shapes to correctly position in the guide plate.

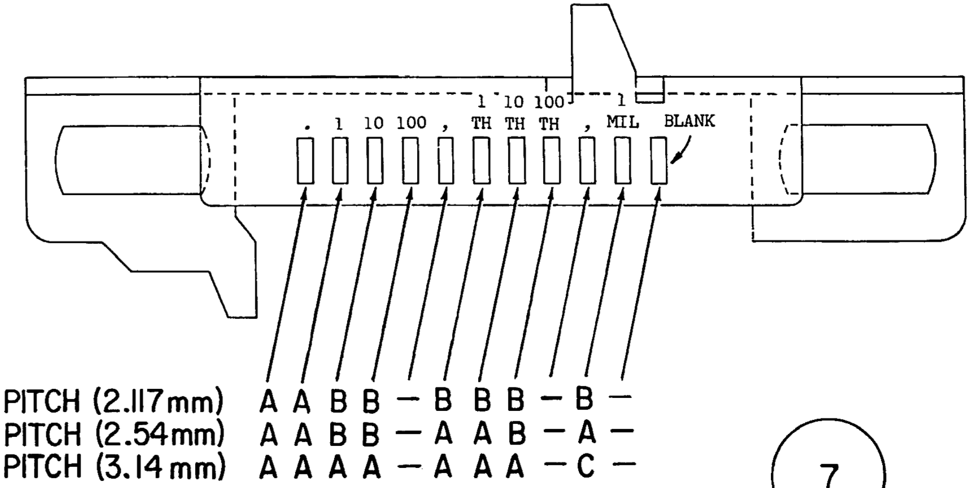
Figure 6 shows the three different stop blades which are available:

- The stop blade marked "A" is straight.
- The stop blade marked "B" is offset to the left.
- The stop blade marked "C" is offset to the right.

Figure 7 identifies the stop blades (by letter), and shows their correct position in the guide plate of 8-, 10-, and 12-pitch machines.


B

⑥


.
1
10
100
,
1 TH
10 TH
100 TH
,
1 MIL
BLANK
12 PITCH (2.117mm) A A B B — B B B — B —
10 PITCH (2.54mm) A A B B — A A B — A —
8 PITCH (3.14 mm) A A A A — A A A — C —

⑦

CARRIAGE RETURN COMMAND MECHANISM

Figures 8 and 9 are shown so that the carriage return command mechanism of the "single key" tabulator bar machines and the decimal tabulator machine can be compared and the differences noted.

Figure 8 shows the carriage return command mechanism of the "single key" tabulator bar machine.

In this mechanism, depression of the carriage return key causes the service cam clutch to engage through the movement of the frame (2), rocker (4), bridge (3), and trip link (1). The back space key also actuates the same trip link (1) and command bridge (3), through the command bail (5), to start a service cycle.

The backspace pawl is free to momentarily engage the escapement rack at the completion of the carriage return operation. Consequently, it is not recommended to stop a carriage return operation prematurely with the back space key, since the backspace pawl would engage the rack while the carriage is coasting to a stop and cause a grating sound.

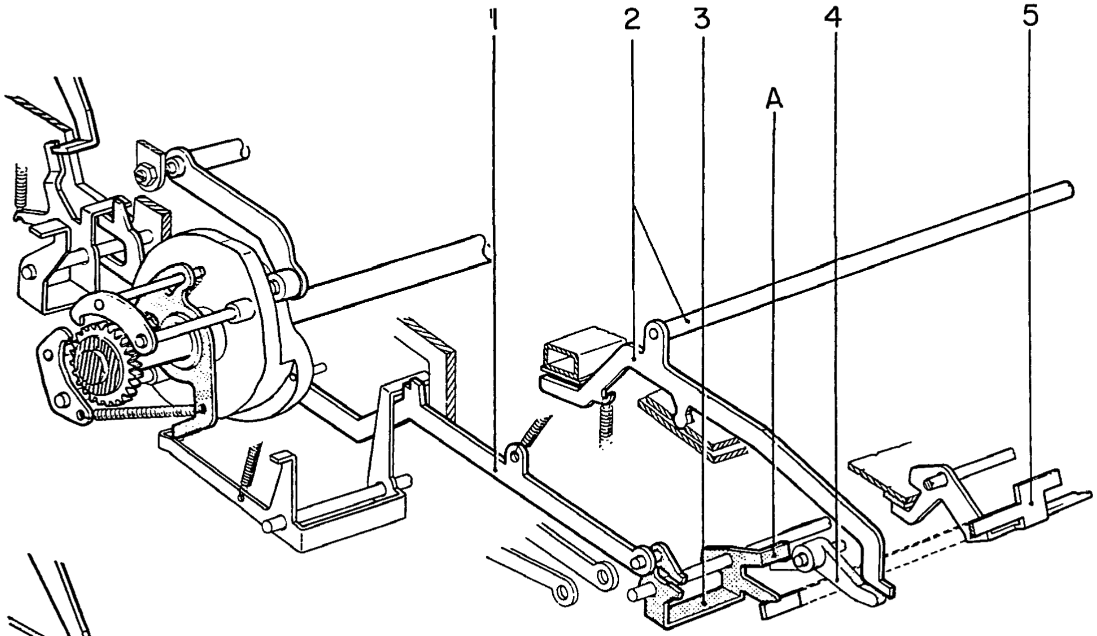
The decimal tabulator machine is designed to permit a carriage return or tabulation cycle to be stopped prematurely by depressing the back space key, without actuating a backspace cycle.

Figure 9 shows that the carriage return command on the decimal tabulator machine has been transferred from the inner (backspace) trip link (1) to the center (tabulator) trip link (7).

The (tabulator) command bridge (6), figure 9, has been modified by adding the extension (B). The (backspace) command bridge (3), figure 8, has been modified by removing the wing (A).

The text on the following page describes how the backspace cycle is prevented when the back space key is depressed during a carriage return on tabulation operation.

8



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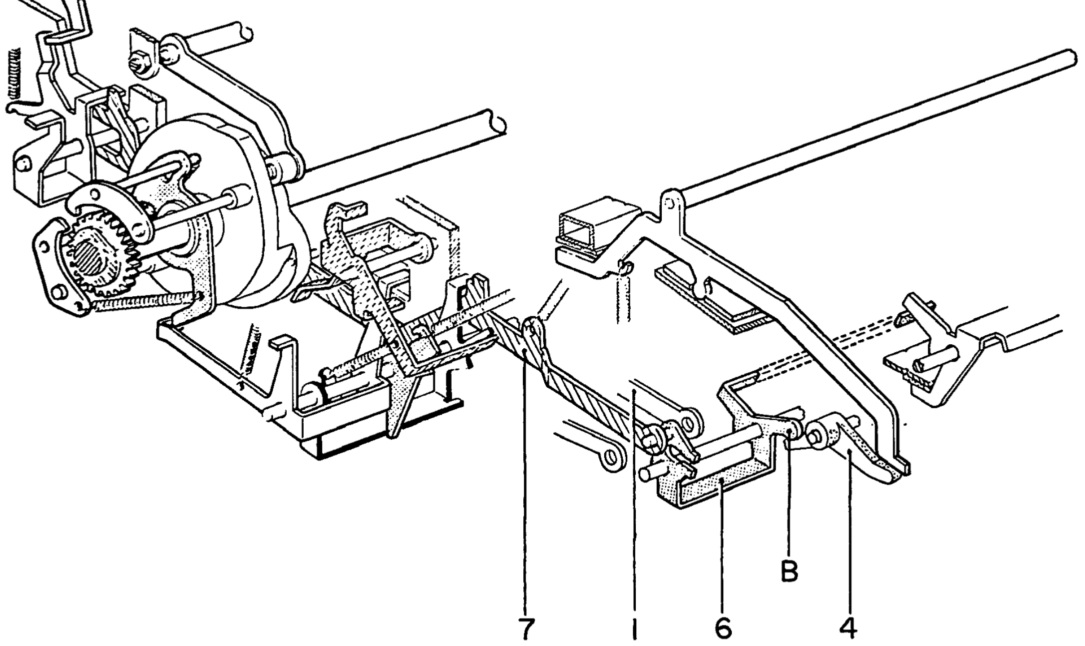

Carriage return and tabulation cycles can be stopped prematurely on the decimal tabulator machine by depressing the back space key, without actuating a backspace cycle.

Figure 10 indicates that either a carriage return or tabulation cycle is in progress, since the service cam is stopped at 90 degrees of rotation by the stop lever (1).

As a result of the carriage return command being transferred to the tabulator trip link (as described on the previous page), the backspace block-out arm (3) rotates in the path of the backspace activating lever (2).

Figure 11 shows that the back space key (5) has been depressed to terminate the cycle in progress. The (backspace) trip link (4) moved rearward and its spur (A) rotated the 90-degree stop lever (1), allowing the service cam to immediately complete the cycle.

The backspace pawl (not shown) was unable to engage the rack since the block-out arm (3) prevented the rotation of the backspace activating lever (2).

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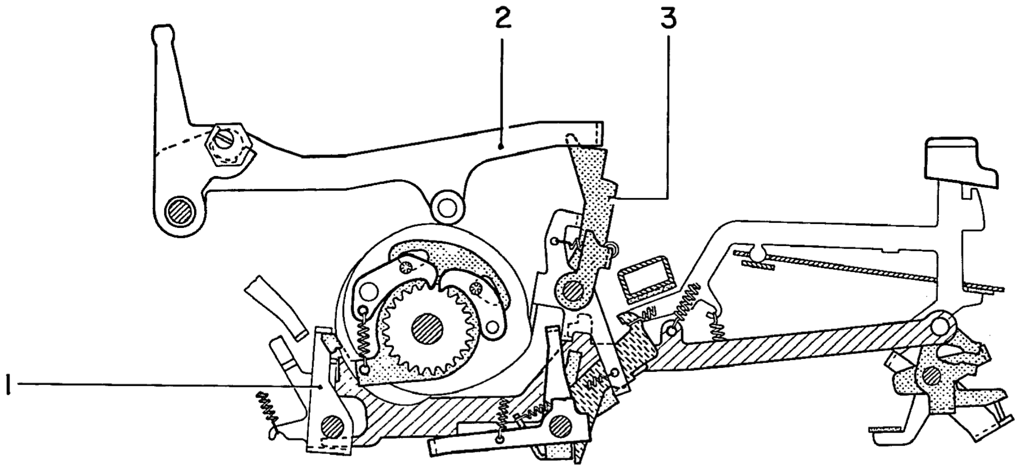

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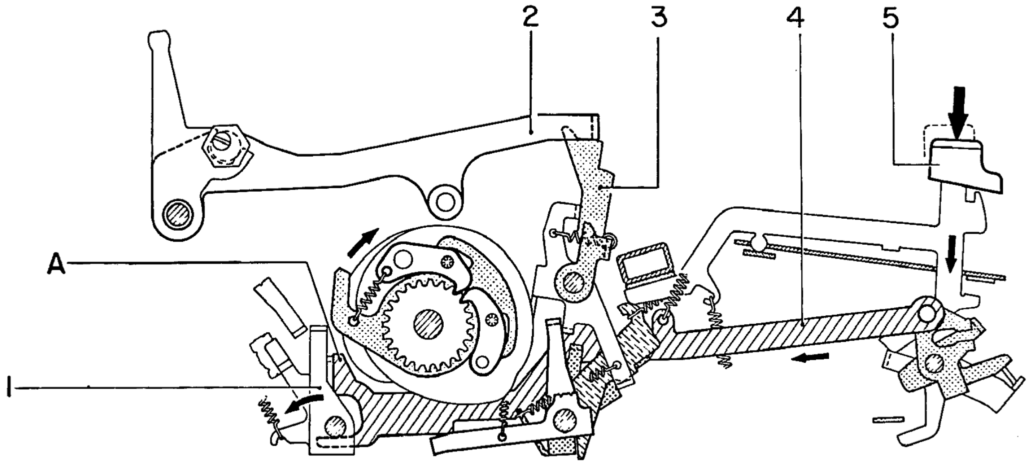


ADJUSTMENTS

Note. All adjustments in Section 24 (Tabulation) of this manual are applicable to the decimal tabulator mechanism, with the exception of the Service Cam Activating Bail (Rest Position) Adjustment.

SERVICE CAM ACTIVATING BAIL (REST POSITION) ADJUSTMENT FOR DECIMAL TABULATOR MACHINE

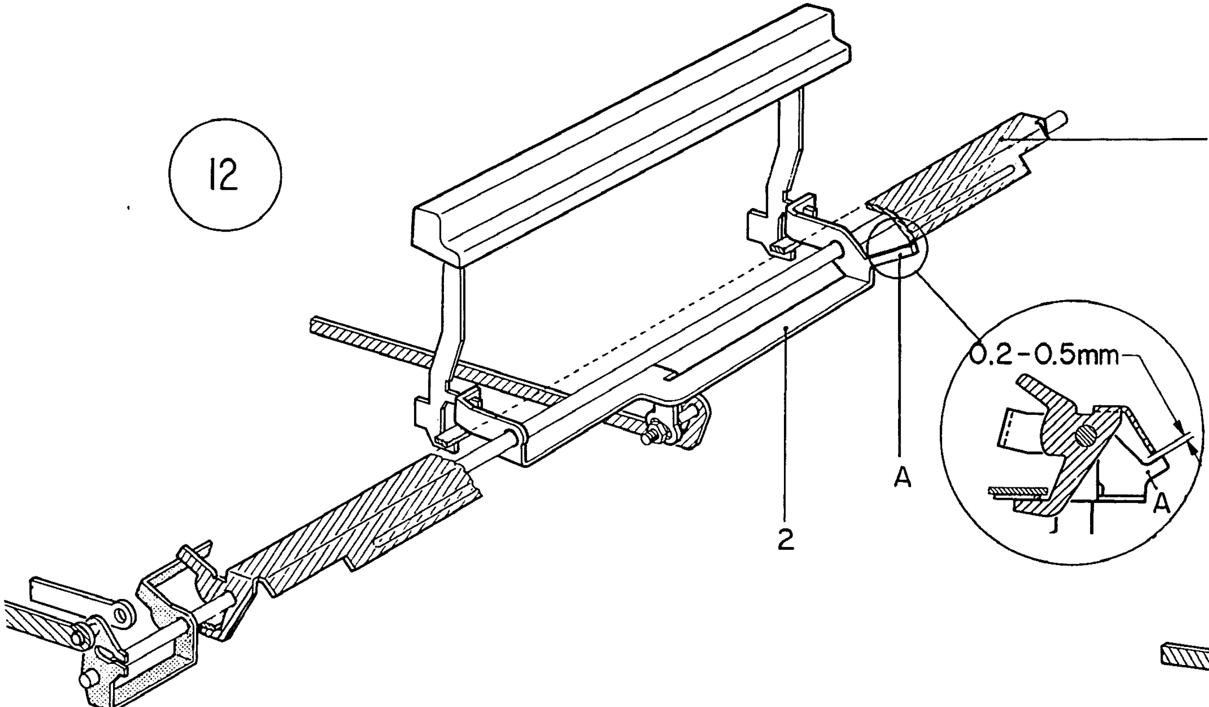
Figure 12 shows, for reference purposes, that on "single key" tabulator bar machines the extension (A) of the tabulator bar frame (2) is used as a reference point to establish the rest position of the service cam activating bail (1).

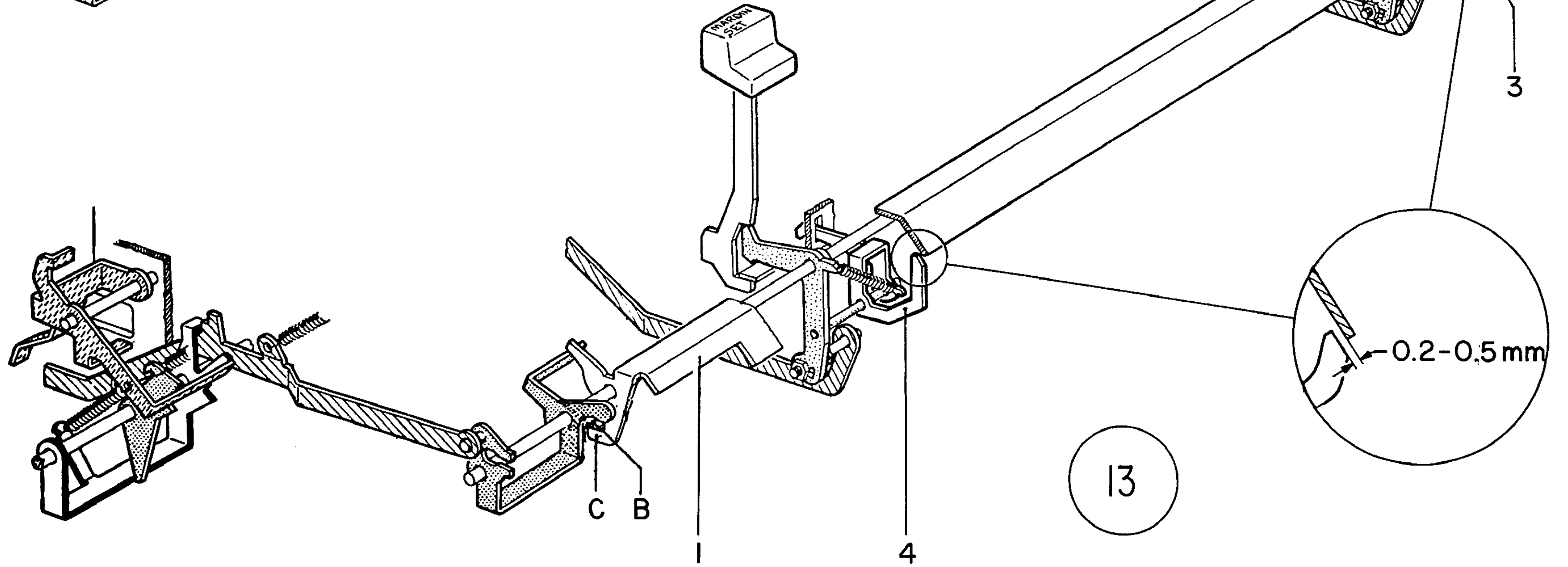
On decimal tabulator machines, the release levers of the margin set and the tab clear keys are used as reference points to establish the rest position of the service cam activating bail.

Figure 13 shows that with the extension (C) of the service cam activating bail (1) at rest against the rubber stop (B), a clearance of 0.2 to 0.5 mm should exist between the release levers (3 and 4) and the activating bail.

To obtain the above clearances, form the extension (C) of the service cam activating bail (1) as required.

12





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